Commodore HORIZONS

The independent Commodore magazine

75p December 1983/January 1984

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PRINTER SURVEY • ROBOTS FOR THE 64

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MORE THAN JUST A GAME...

Commodore
HORIZONS
The Independent Commodore Magazine

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Pete Gerrard has mixed impressions of Commodore software, including Face Ache pictured above

EDITORIAL

WELCOME TO THE FIRST issue of this new magazine for all users of Commodore's micros — whatever your machine, and whether you're a games addict or a serious user you'll find something of interest inside We'll be back on the 12th of January with a February issue — by which time you'll have had a chance to let us know what you think of the magazine From then on *Commodore Horizons* will be published on the second Thursday of each month, so keep in touch. And we've got one particular topic in mind — read on

Commodore is a survivor As a computer company it is one of the few which has withstood the chill winds of the price cutting war sweeping out the deadwood from the American computer industry. Commodore is sometimes blamed for the price cutting war The company's policy is to cut its computer prices automatically in line with falling manufacturing costs — the greater the volume the cheaper the computer becomes especially as a Commodore subsidiary, MOS Technology, makes many of the chips Commodore uses It is good news for all of us that Commodore has now started to adapt its price cutting policy on computers to its software — much of the Commodore add on equipment has been grossly overpriced for the past few years

Despite the size of the Commodore market worldwide, however, there are a very few firms producing Commodore software This is most noticeable when compared to the hundreds of small, innovative software companies producing original material for the Sinclair Spectrum computers We think it is time that those software companies started producing software for the Commodore range of machines Why not join us in a campaign to pursuade some of the Spectrum software houses to start writing software for the Commodore Vic 20 and 64?

We will need to pursuade them that a market exists for their wares, which means that they have to hear from you Write to the *Commodore Horizons* Software Campaign with your pleas and once a month we will mail the full list of names and addresses to over 100 software companies which, as far as we know, do not produce software for Commodore computers Let's see those letters rolling in And tell us what sort of software you would like to see

YEP FOLKS IT'S HERE

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Dragon
Comm 64

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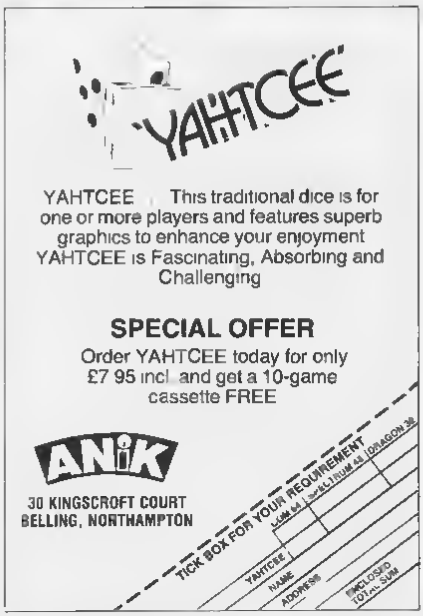

THE

CHALLENGE

Are you game enough to play?

Interesting Games For Interesting People From Anik

LETTERS PAGE

Calling oll pool ployers

I WOULD like some Vic 20 adventure games published because not many magazines have adventure games in them. Would it also be possible for someone to send in a snooker or pool program for the Vic?

Michael Cahill
Hoddesdon
Herts

WELL, WOULD IT? keep reading the magazine and you'll find out if anybody has obliged. As for adventures, we'll definitely be doing some reviews and programming articles soon

Unusuol Vic feotures

SO MUCH attention has been placed elsewhere on the faults of the Spectrum that some very unusual features of the Vic have been neglected.

Plug a Vic 20 onto a teletext television and run this line

FOR I=0 TO 65536 PRINT CHR$(PEEK(I)), NEXT

While this is happening, select teletext page 100. Sometimes random green letters appear in the top right hand corner, where the time normally is.

Another point is that the documentation for the Superexpander cartridge is deficient. An extra command, Graphic 4, will give almost all the RAM to the user but will crash the computer if graphic 1, 2 or 3 hasn't been previously selected.

Other things not mentioned are the fact that function keys can be programmed in a program and that chords can be played in a PRINT statement.

Stephen Loughran
London NW6

Confusion reversed

I BELIEVE some users may be confused by the colour sign for control 3 (red). This is shown in *Personal Computing on the Vic 20* as the reversed oblique stroke (see page 153 — special symbols).

However, on our Vic 20 pressing control 3 prints up a reversed £ sign symbol. This caused a lot of confusion when we were first learning to use our Vic as some programs use one symbol and some the other.

I hope this will be of some help to other first-time users.

Lynne Turner
London E16

Right royal request

I AM interested in submitting a utility program to your magazine to help users with their home accounting. It runs on a Vic 20 with +3K RAM.

Before submitting the program I wish to know how much you pay for programs and if you pay an outright price or a form of royalties on the amount of magazines sold.

R G Varns
Crayford
Kent

I'M AFRAID you're not going to get rich by contributing programs to *Commodore Horizons* (think instead of the pleasure and privilege of appearing in print!). We pay £6.00 for listings published in Software File, and up to £30 for our Star Game (and no, don't start thinking about royalties — our office Sirius couldn't cope with the strain)

Simulotion locoted

A RELIABLE version of simulated PRINT AT uses the following Vic memory locations

209 210 Pointer to screen line
211 Position of cursor on above line
214 Row where cursor lives

The above is an extract from the Vic 20 programmers' reference guide.

My routine is as follows

A=7680+Y*22 B=INT (A/256) C=A—B*256
POKE 209 C POKE 210
B POKE 211 X POKE 214,Y

J D Peel
Market Harborough
Leics

Cossette oggrovotion

MY VIC was purchased as a replacement for a ZX81. When I originally purchased the ZX81 I also bought a good quality cassette (computer compatible) to go with it, and that is the problem.

Recently I wrote to Commodore and duly received a letter informing me that if I took my cassette recorder to my local dealer I could have it modified. The manager of my local dealer informed me that it did not carry out this type of work and was only an agent.

They could forward my cassette recorder to Commodore but there would be a handling charge of about £10 plus the cost of the work to be carried out. At this point he did say that other customers of his had expressed similar complaints. All that was needed in most cases, he said, was a cable with the appropriate plugs and fittings to enable the cassette recorder to be used with the Vic 20.

Have other Commodore users overcome this problem? If so, could they supply information where the parts can be purchased and how the work is carried out.

Terence Webb
Redruth
Cornwall

Interpreting the words

I HAVE been interested in micro computers for well over a year now (even to the point of it becoming a mania sometimes) but to date have only 'played' with those micros on demo in shops.

Now has come the time to buy one and after much deliberation I have decided on the Commodore 64, mainly for two reasons.

1. The built-in music synthesiser seems to be more advanced than in other micros of same price.

2. The 64K RAM (it would cost me more to upgrade a Vic 20 to the same capacity, and besides that I hate the 22×33 screen display).

But in the CBM 64 data sheet it states that 'existing Vic and 40 column Pet Basic programs can be easily converted'. I would like to know just what 'easily' means. I rang Commodore re this and they said it's practically a complete re-write (this is not my idea of being easy).

One would think that Commodore would have designed a conversion cartridge to plug into the rear part of the 64 which would enable direct input of Vic software.

M R Hoe
Skegness
Lincs

I mean you didn't really expect your name was written in a great big thumping real leather bound BOOK OF LIFE did you ?"

This is the chance to air your views — send your tips, complaints and compliments to Letters Page, Commodore Horizons 12-13 Little Newport Street London WC2R 3LD


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ARGOTRON
GRIDRUNNER
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NEWS DESK

Commodore gets that tip-top feeling

COMMODORE now claims to be the top selling UK home computer company

A spokesman for Commodore said that reports from retailers indicate that "unit sales of the Commodore 64 and Vic 20 machines now exceed sales of the Sinclair ZX Spectrum and ZX81 models", Commodore's closest rivals.

"We have been British brand leader in sterling sales for some time but now we are ahead in units, bringing us into line with the situation in the US" the spokesman added

In the US it is now estimated that Commodore has captured 43% of the $1.1 billion market for under-$1,000 personal computers Its nearest rival, Texas Instruments is estimated to have a 23% share of the US market, with Timex (marketing the Sinclair machines) only 9%

In recent months, during a fierce US price war, Commodore has broken ahead of its American rivals many of whom — Atari, Texas and Mattel — have reported heavy financial losses

Indeed so damaging has the price cutting been to some that Mattel has indicated a wish to withdraw from the home computer market — and Atari announced in October losses of over $100m for the third successive quarter

Commodore, surprisingly under these circumstances has announced record annual profits up to $91m on sales doubled to over $680m Commodore chairman Jack Tramiel attributed the growth largely to "extremely strong demand for the 64"

In the UK Commodore has stepped up production of the 64 to try to ensure sufficient stocks for Christmas but it already seems likely that demand may outstrip supply

A Portable feast

THE CBM 64 portable computer will go on sale in Britain before Christmas, according to Commodore UK's marketing manager, John Baxter

First shown at the Chicago CES show in June the SX64's launch in the US is now "imminent"

The SX64 has 64k RAM and is based on the 6502-compatible 6510 chip It has a built-in 6 inch colour monitor and single floppy-disk drive with 170k storage capacity The detachable keyboard is of the full-size full travel type

The unit has cartridge, Centronics and monitor ports and is compatible with Commodore 64 software and peripherals including the VicModem unit

A Z80 cartridge/disk is planned for the SX-64 to make it CP/M compatible

Languages planned include Pascal, Logo Comal, Assembler and Pilot

No UK price has yet been fixed but its US tag of $995 would suggest a price of around the £900 mark A review of the machine is scheduled for our next issue

Precision offers database potential

SUPERBASE 64 is a new programmable database and information retrieval package for the Commodore 64 from Precision Software

At its most straighforward Superbase 64 offers the user a menu driven system within which individual record structures can be built up The database can hold up to 15 files, each containing an unlimited number of records Each record can contain up to 11,000 characters placed in up to 127 fields spread across four screens

Within these constraints you can build up whatever record or file structure you wish

However with Superbase 64 you can go one step further With the user programmable interface part of the package you can adapt the database software to your own precise requirements using the Commodore 64 Basic in conjunction with 70 additional Superbase Basic commands *Select, Find* and so on

Says Precision's Peter Thomas "You can build almost any specialist application you want For example, if you want an accounting system you can build one with very little work"

In the next six months the company plans also to release a range of add-on software packs for Superbase 64, developed using the Basic extension — providing, to start with stock control and accounting

Superbase 64 is available on disk, complete with a 200 page manual, priced at £99 95

Rose blossoms at Phoenix

PHOENIX Software is a new games company set up by Gerry Rose, one of the founders of the predominantly Vic 20 software house Romik

The new company has an interesting idea — it will sell two-cassette games containing both an arcade style game and an adventure type program

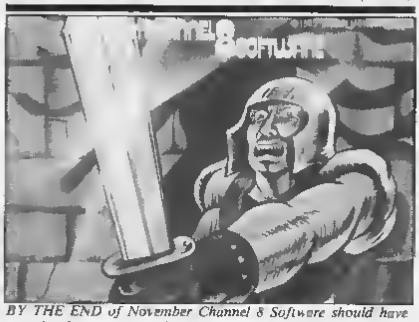
Before you can begin to tackle the adventure you must master the arcade game, giving you access to the loading code for the adventure Also, clues for solving the adventure are revealed as the arcade game play progresses

To begin with Phoenix has two titles for the Vic 20 and one for the Commodore 64

In Four Gates to Freedom for the Vic you must first destroy the four gates which bar your way, before entering the catacombs of the planet Xzmos to rescue 20 scientists trapped in suspended animation

In The Sorcerer's Apprentice for the Commodore 64 you must temporarily stop the brooms from fetching water Then you venture into the sorcerer's castle in search of the spell to put paid to the brooms once and for all

All titles are priced at £9 95



BY THE END of November Channel 8 Software should have completed conversion of all 10 Mysterious Adventures from Digital Fantasia for the Commodore 64 The 10 titles are all traditional style graphic adventures written by Brian Howarth The Golden Baton, Arrow of Death 1, Arrow of Death 2, The Time Machine, Circus, Feasibility Experiment, Escape From Pulsar 7, The Wizard of Akyrz, Perseus and Andromeda and Ten Little Indians Each of the titles is priced at £9 95, available on cassette

The Six-Four Supplies Company is THE specialist for the Commodore 64. Our range of products in support of this machine includes a wide range of peripherals, devices and software to cover the needs of home and business user alike. We intend to offer an unrivalled selection of products covering every aspect of using a Commodore 64

SOFTWARE

The software list shows in order the product name/producer/product type/genre prefix to indicate cartridge (.) disk (d) and cassette (c). These are fully remarked in our product sheets. Producers initials here simply identify like named products for price checking. The product types are: acct accountant, adv adventure, asst(bfu) (bmc) (ass) assembler (+ utilities), bus business, comp computer, data database/sorter/sortwriter, edu educational, fin financial, hbo home finance, intf interface, lang language, OS mainly mystery, adventure, mon(bfu) monitor (+ assembler) (+ utilities), ref(+ reference, database, self, space adventure, spr spreadsheet, stat statistics, txe text editor, util utility, wp wordprocessing, wpu wordprocessing utility, m m program. Included games products are suitable for serious applications. Some prices may now be lower. Please specify choice of cassette (c), disk (d) or cartridge (.). Add 20p for p&p on orders less than £20. Europe £1.00 per item.

.1941 Backup SSFT ut d17 50 c18 50 .3D Time Trek ANG game c8 90 .64 FOURTH HES lang c48 90 .64 Sphere SICK game c5 75 .64 Sprite Editor SICK utl c5 90 .6502 Professional System HES c21 90 .Abracadabra ABCD prod d12 50 c25 00 .Accountant Junior LEV5 adv c9 50 .Alien Panic 64 BB game c3 99 .Specialists Computer AHGC c13 90 .Amstrad RAM game c5 75 .Apple Cider Spider SOH c24 00 .Arnoon Bounce HES c14 50 .Arnodia 64 IMAG game c5 50 .Arnoquasar OCMC game c8 75 .Assembler Tutor CBM utl d29 92 c28 95 .Assembler Dos CBM utl d24 95 .Assembler Option DOM bus d54 75 .Attack of the Mutant Camels LSFT game c6 75 .axom DMST d26 00 .Beedle SRSS d25 00 .Boss Street Mugs BBND d50 00 .Book Manager 64 CNLP fin d9 50 c7 25 .Boot Sector Recover HES d32 00 .Bulmoon DMST d11 50 .Bishop CBM edu c5 99 .Data of Blackjacks SRSS adv c29 90 .Business TOIL asst d70 00 .Basic Cache SSFT asst d45 00 c43 00 .Bell Writer SSFT wp d53 00 d43 00 .B-1 Nuclear Bomber AHGC c11 50 .BOMJUP + FILE CLONE CLIM utl c15 00 .BBC Monochrome CBM dsy c8 99 .Late Assault KOBR spr d8 15 00 .Candy Bandit HES d21 50 c21 50 .Cannonball Blitz SOL d7 90 .Cavern Bud 64 BB game c3 99 .Cassettoline Interface ADGC utl c8 85 .Centipede RAB game c5 75 .Street Beat HES d25 00 c21 50 .Chemistry CBM edu c8 90 .Chopliftr BBND game c33 00 .Classic CBM game c6 99 .Codewriter DYNA bus d90 00 .Commodore Dictionary LEV5 adv c9 50 .Comet Lander BTS d29 00 .Computer Stocks & Bonds AHGC c14 50 .Concentration SICK game c6 75 .Cosmic Life SPNA ref 39 50 .Crawlers Convoy TASK game c8 75 .Cosmic Capers SSFT adv d18 00 c7 50 .CoCo 5 HES d32 00 d19 00 .CoCo HES c36 00 d36 00 .Crazy Bang INTM game c6 75 .Crazy Cowboys SOL 24 00 .Critical Boss SRSS d29 00 .Crossword Tutor SICK game c5 75 .Cube Crunchy Bubble EPYX d29 50 .Curse of Ra EPYX adv c13 50 .Cyclone AMB game c5 75 .Che FOURTH PMP lang d70 00 c 0 00 .Death a Midnight Magic BBND d25 00 .Doodlebug NPO made d37 00 .Dance in the Carnaboss MLAB d85 00 .Depth Charge CBM game c3 99 .Diary 64 TOIR fnb d40 00 .Diary 64 Discover CBM game c5 75 .Disc Saga MLAB d70 00 .Disappearance of Perth EPYX d28 00 d29 00 .Disappear SICK game c5 75 .Double SYNP game d22 00 d25 00 c25 00 .Dungeon Beginners LEV9 adv c5 50 .Easy Cold Assault KOBR asst d72 00 .Easy Script CBM wp c 5 00 .Easy Spell CBM wpu d50 00 .Easytrack CBM bus d75 00 .Eagles Language CBM edu c5 99 .Escape MCP RAB game c5 75 .Face Ache CBM game c4 99 .Fascinator SPNK sdc d24 00 d25 00 .Factory Manager DOM fin d138 00 .Fast Edwin SRSS d25 00 .Five Star EPYX d25 00 c25 00 .Flying Ace AHGC c18 50 .Foot a Dose KOBR game c6 75 .Football Strategy AHGC c11 50 .Foul Apocalypse SYNP d25 00 c25 00 .Freedom Fever SYNA d24 50 .Frogger 64 INTM game c6 75 .Frogger SOL game d25 00 c25 00 .Program ANG game c5 75 .Gun with Air EPYX c29 00 .Power Finance CBM fin d75 00 .FOURTH 64 AOBR lang d40 00 .FOURTH ADGC lang c29 90 .Gateway to Apshai EPYX adv c29 90 .Galaxia OSFT d21 50 c21 50 .Geography CBM edu c5 99 .Gamblitzer STS d18 00 .Glass Grabber MLAB d29 00 .Gate to Tomorrow SSFT adv d18 50 c9 00 .Good CBM edu c12 00 .Go SICK game c5 75 .Groundwater ADGC chess c8 95 .Graphic 64 SSFT utl d12 50 c10 50 .Hydromania HES game c29 00 .Hydromania 64 LSFT game c5 90 .Gobbly SMLK game c6 50 .Hammer 64 HES menu c29 00 .Hexwriter 64 HES wp d33 00 .Hey Diddle Diddle SPNK adv d21 50 .High Frost CBM game c11 99 .Highway MLAB d75 00 .History LEAM edu c8 90 .Home Manager HES nfm d35 00 .Hobson Bone Boiling MELM game c5 75 .Hungry Hoppes MELM game c5 75 .Power 64 game c5 99 .Jack to Basic 1 CBM utl d14 95 c14 95 .Jaguarsoar SOL d25 00 c21 50 .Juice IRON d25 00 .Jacky Blue EPYX d21 50 c21 50 .Jungle Jim SMLK game c6 99 .Jungleman Junior EPYX c29 00 .Kasmir SSFT game d10 00 c6 00 .KM Bold IRON d25 00 .Kiss on Guys SPNK d24 50 .Kombinezon SPNK adv d1 00 c21 50 .Knights of the Desert STSI game c3 99 .Krazy Kong BB game c3 99 .Label Printer BB utl c5 99 .Labyrinth CBM game .0 .Laser Zone LSFT game c6 75 .Life SIL game c5 75 .Lobster Catcher CBM game c11 00 .Lost in the Labyrinth SICK game c5 75 .Lower Bounce EPYX c29 00 .Lower Bounce THP game c5 75 .Magpie Media CBM game c4 99 .Mailpro 64 KOBR wpu d70 00 .Manpower SSFT game c16 50 c16 50 .Matchmaker CBM game c8 99 .Mathbuster 1 CBM edu c8 99 .Mathematics II CBM edu c8 99 .MIPlus Boss DMST d71 50 .Matrix 64 LSFT game c6 75 .Maze Master HES c29 50 .Poison Pod BB game c3 99 .Midway Campaign AHGC c11 50 .Milton AmerMaker SSFT asst c50 00 .Milution On SPFT game c7 95 .Money Manager CBM fin c8 99 .Monster ADGC mon c29 90 .Moonstrike RAB game c5 75 .Monster Revenge DMFT d25 00 c25 00 .Moon Shuttle DSFT d21 50 .Moon Power ANGC c16 00 .Moral SYNP d25 00 c25 00 .Motor Mania ADGC game c6 95 .Mr Cool SOL 24 00 .Mr Whimpy OCMC game c6 75 .Music Composer LBM utl c8 99 .MTC Sort 64 CHIP asst c7 75 .N Atlantic Convoy Raider AHGC c11 50 .Note Pad 1 ELI utl d40 00 .Noon Pro Bridge ELI utl d25 00 .Nuberwar AHGC c11 50 .Noon Racer CBM game .Nonsonic NES sprt d70 00 .Orcula 64 KOBR game d100 00 .Oduche STI game c5 75 .Easy Orange BRSS d25 00 .Pi Filly 4 Miles DSFT d21 50 c21 50 .Paint Wizard DMST c26 00 .Paint Brush HES d21 00 .Pharaohs RAB game c5 75 .Pac 64 KOBR asst d12 00 .Panic 64 INTM game c6 75 .PaperCity KOBR wp d60 00 .Patrick Hunter Jeopardy CBM edu c8 99 .PetSpeed 64 CBM comp d50 00 .Phoenix a Curse SYNP c25 00 .Physics CBM edu c8 99 .Pictory EPYX c29 00 .Planet Miners AHGC c11 50 .Plasmoid NPO d35 00 .Poemsoft + Dictionary AmeHigh CHIP game c5 25 .Poeyes DSFT c21 50 .Power Printer BB utl c5 99 .Power 64 AOBR utl d72 00 .Printing 64 + mailo SSFT utl d30 00 c30 00 .Professional Blackjack SPPN game d41 00 .Programmer's Utilities CBM utl c14 99 .Projector II SYNP game c25 00 .Purchase Accounting KOBR asst d105 00 .Purchase Ledger 64 AGIN asst d113 85 .Quickmapper CBM quiz c8 99 .Quickner BB tsx c5 99 .Carrier a Mass Planet CBM mmmp c8 99 .Rail Boss CBM game .Renaissance ADGC game d8 95 .Remember SSFT ut d9 50 c7 50 .Repton SRSS d29 00 .Research Assistant TOTL rdb d30 00 c27 00 .Rent Bed HES c29 00 .Ringside Seat STSI d29 00 .Power Tools ADGC game c8 50 .Robot Bot a USA c21 50 .Rollerball IN SPN game c6 75 .Rome a Rampage EPYX d29 00 .Downwound DMST d71 50 .REL KOBR utl d35 00 .RUN 64 LSFT game 5 00 .Sales Accounting KOBR acct d105 00 .Sales Ledger 64 AGIN acct d105 00 .Sammy Lightfoot SOL c27 00 .Screamin 64 INTM game c6 75 .Serial 64 RVTC wp d70 00 .Sea Dragon ADM d25 00 c25 00 .Sector Alpha BBND game c6 00 .Sector and Starbrey SICK game c5 75 .Revolver SYNP d25 00 c25 00 .Serpentine BBND d29 00 .Sesamoids POST game c6 75 .Sensational Archer SRSS d29 00 .Shamus SYNP d25 00 c25 00 .Shoya POST game c8 75 .Silicon Warrior EPYX c29 00 .Simons Basic CBM utl d50 00 .Sketcher 64 MS acct d172 50 .Skeleton SMLK game c8 50 .Space Pilot SRSS d25 00 .Space Pi POST game c6 75 .Spacepor Prowler Case 15 PNK mdy d28 00 .Backup Power CBM game c4 99 .Space Rescue! 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And now . . . Revenge of the Mutant Camels

JEFF MINTER of Llamasoft is working on a new game for the Commodore 64 — Revenge of the Mutant Camels

In it you take the role of a mutant camel fighting back against the camel's defeat in Jeff's previous arcade action Attack of the Mutant Camels

You have three mutant camels with which to win your way as far as possible through more than 40 attack waves

Each screen has a different theme — in Rocka and Roll-up you are attacked by huge boulders and mutant cigarettes In other screens you meet mutant mutant camels(!) a figure called Eugene hurling axes and worst of all, Manic Minter

You camels can fire in eight directions and can jump Says Jeff "The camels jump in a really ludicrous way and when they sit down they look very silly It's great"

Jeff Minter The camels jump in a really ludicrous way

The new 64 game should be finished by mid December — price £7 50 Then Jeff will start work on his next Vic 20 game the follow up to Megagalactic Llamas Battle at the Edge of Time

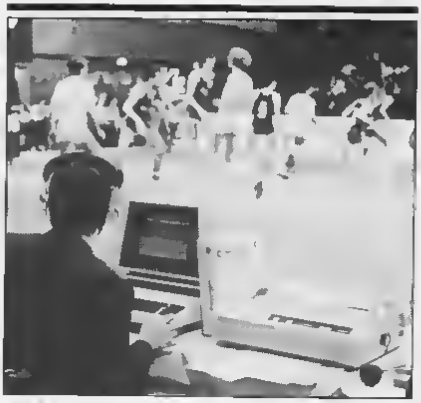
Corby factory in full swing

PRODUCTION of the Vic 20 and Commodore 64 machines is now in full swing at Commodore's new plant in Corby Northants

Over 5 000 computers a day are coming off the production lines only eight months after Commodore announced its choice of Corby for the £20 million plant

The new factory is the centre for European manufacturing of home and personal computers — one of four such sites worldwide — and machines from Corby are exported to the rest of Europe, Scandinavia and Africa

At present the Corby works employs 160 people, but Commodore is currently negotiating a loan from the European Coal and Steel Community to allow expansion in 1984 This would more than double the numbers employed and push the number of computers manufactured per year at the site over the 3 million mark



COMMODORE is certainly out to score points with British sportsmen — especially the basketballers The English Basketball Association has netted a £70,000 two-year sponsorship from the company over the next two years In the past Commodore has devised and operated a unique scoring program for the association which allowed information to appear instantly on the screen during TV transmission of games

Cheaper printing

IF YOU are looking for an inexpensive printer option then Softex Computers in Bournemouth may have the answer

For £20 95 the company is offering an interface and power supply that will enable the low cost Sinclair thermal printer to be used with the Vic 20 or Commodore 64

Software supplied with the interface converts the Commodore character set into the dots printed by the Sinclair ZX Printer and provides a number of control commands

Softex will also supply the package complete with a ZX Printer for £[illegible] 95

Alice makes you wonder

ALICE in Wonderland is a new disk-based graphics adventure for the Commodore 64 that looks like setting the standard for future releases

Following the story of the original Lewis Carroll book closely, the adventure takes the form of a sequence of sophisticated arcade style games featuring an animated Alice figure

What marks the game out are the cartoon quality graphics and the continuous soundtrack of music

Alice has been developed by a US software house and will be available in this country through Audiogenic No date of arrival or price have yet been set

Stack promises all the fun of the fair

THE STACK Light Rifle is a new idea for the Vic 20 and Commodore 64

The rifle when connected to the computer running specially developed software can be used to "shoot" targets on screen

The device detects a hit or a miss by comparing the time the trigger is pulled with the time the tv takes from starting a scan to reach the point you are aiming at

When the tv scan reaches the point on the screen at which the rifle is aimed, light from the tv activates a light sensitive cell inside the rifle barrel

The rifle will only work with software written specially for it So far Stack developed six titles Rats and Cats Crow Shoot, High Noon, Glorious Twelfth Escape from Alcatraz and Big Game Safari

The Stack Light Rifle will be available from mid November and is supplied complete with three games titles at a price of £29 95

If you think you've something newsworthy call 01 437 4343 and let us know

Commodore brings out a mixed batch

SOFTWARE REVIEW

Pete Gerrard takes a long hard look at the software Commodore itself puts out

COMMODORE Business Machines are more usually known for their hardware than their software, but this month sees the start of a determined campaign on their behalf to break into this lucrative market

We've picked out some of their games for both the Vic 20 and Commodore 64, and to get the ball rolling we'll start with the 64 side of things and the ludicrously named MaggotMania

This Commodore 64 game is supplied on cassette, and although you have the option of using either a joystick or the keyboard to control the game's events those of you with less than 20 fingers would do well to use a joystick

Like so many other games this one falls into the category of versions on a theme, as it is nothing more than a poor impersonation of the arcade favourite Centipede

Garden defender

For those unfamiliar with the genre Centipede (and MaggotMania) cast you in the role of defender of the garden a sort of Buck Rogers meets David Bellamy, who has to fight off hordes of maggots, spiders and snails. The maggots are merely intent on eating you, and waltz their way about the screen cannoning off any flowers that happen to get in their way

You, being a lesser creature, cannot cannon in the same way, as any collision on your part with a flower results in the loss of a life Spiders enjoy similar luxury to the maggots, and they make occasional forays into the garden in the hope of bumping you off

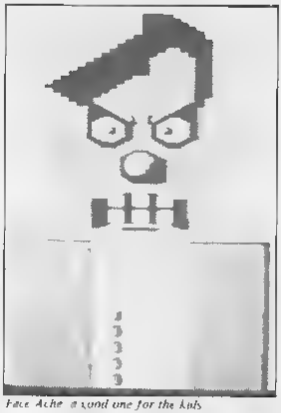
The snails aren't particularly dangerous, and provide you with a 1,000 point bonus should you hit one before it destroys too many flowers

In action it s a none too inspiring version of an arcade favourite, and on the 64 comes out looking more like a shoddy version of the rightly popular Gridrunner, from that company obsessed with Llamas

Your little creature is confined to the bottom few rows of the screen, and when some of the maggots inevitably get past you, they race about at breakneck speed in a frantic effort to collide with you and thus lose another of your lives

Response from the joystick is quite reasonable but overall the sound and use of graphics are merely hinting at the power of the 64 and are by no means using anything other than a fraction of the capabilities provided

A poor game considering what could have been done Stick to the arcades, if you like demolishing maggots spiders and snails a gastronomic delight



Face Ache a good one for the kids

Jupiter Lander, a familiar-sounding title from the dawn of computer games turns out to be another flop In its current guise, after appearing under names such as Lunar Lander in the early Pet days, it first appeared on the Vic 20

Little excitement

The version produced for the 64 has hardly changed at all from the Vic version, and is as boring now as it was then About as exciting as making toast

The object of the game is to land a spacecraft on the surface of the planet Jupiter, a surface which has strange platforms on it, with bonus scores written on them. Carl Sagan, eat your heart out

Using either joystick or keyboard, you have to manoeuvre your spacecraft left or right and your only other control is over the thrust of the rockets

A delicate hand on the controls is required as initial experiments with the game left me failing the NASA initiation test and taking giant leaps into outer space again Jupiter seems a bit too big to miss altogether, but when your only control is a joystick it's all too easy

This game is boring The initial screen shows three platforms on the surface of the planet, which give you either 2, 5 or 10 times bonuses for achieving a successful landing When you near the top of one of these platforms the screen image expands, and a single platform fills up the entire playing area

Unless you're an extremely dab hand at controlling the joystick, and manage to land at precisely the right speed, exactly in the middle of the platform, it's back to the launch pad as another ship bites the dust

Once you have got the hang of it all, the game ceases to lose whatever minor interest it might once have held, as there are no additional hazards, no speeding up of the action, and no changes You just keep on landing on the planet, then going back for another go again

The one virtue of this game is that it is supplied on a cartridge so you won't waste several minutes waiting for it to load

Send in the clowns

Clowns At this stage after ploughing through the first two games, this amply summed up my opinion of Commodore for bothering to put them onto the market at all

But Clowns did at least manage to restore some of my faith in their ability to write computer games even if, like so many other games, this one is about as original as most of the music in the current top 20

Clowns first appeared for the Commodore Pet back in 1979, and once more this new version for the Commodore 64 (supplied in cartridge format again) has added very little to the original game

You control a little clown on a see saw who has to balance it under another clown who has, kamikaze-style launched himself into space from one of the four platforms on the edge of the screen

If you manage to position this see-saw correctly, the impact of the clown landing on it sends another clown soaring towards the top of the circus tent (otherwise known as the top of the screen) where Yosser like, he has to nut one of a succession of balloons passing across the top.

There are three rows of balloons, in different colours just to show that the Commodore 64 has got colour, and clearing whole rows of balloons rewards you with various bonuses Each balloon is also worth a few points depending on its colour

One thing that is noticeable about the packaging purely by its absence is a warning saying that this game requires the Commodore games paddles in order to play

it properly. No joystick controls, no keyboard controls so unless you're one of the very few people who have a set of paddles, this will not be one of your most interesting games.

Once you do get started it is actually quite addictive, as your little clowns hurl about the screen, leaping up and down on the see saw and nutting all the balloons that they can find. The action gets faster as you progress, although you can get a satisfying high score by hardly moving at all, once the rhythm has built up.

To conclude, quite fun, but ultimately one has to say that the 64 deserves better than this. And they should have said something about those paddles!

Join the rat race

Radar Rat Race — a game about commuting perhaps? No, no, this one puts you in the guise of a blue rat, being chased by a horde of red rats, gobbling up cheese as you move around the screen, and attempting not to bump into any of the deadly cats the lurk about.

The screen display is quite imaginative. The left-hand side of the screen shows only a part of the entire maze in which you find yourself. The right hand side contains all the details of the scores, bonuses, lives left and so on, together with a miniature map of the whole maze, showing where all the cheeses are to be found.

Since your little blue rat requires a lot of cheese before he can progress to the next level, this comes in quite handy. Of course, one could say it is there to make the programmer's life easier when controlling sprites, but that would be uncharitable.

Once again this comes in cartridge form, and this is much to be preferred to tapes or disks. It's much more reliable, and takes just seconds to install.

Using a joystick as your control, the action is fast and furious, as the chasing red rats (three on the first level) show an uncanny ability to find and chase after you. They can be put off the scent for a while by spraying a smoke screen behind you, but you've only got a limited amount of smoke, so be careful.

One of the lumps of cheese is a special one, which doubles the score you get for eating any other bit of cheese. At least, it does until you lose a life.

Getting through one level brings you to screen two with four rats after you. Getting through this one brings you to the manic speed run, where you have the entire time allowance (not very generous) to eat all the cheeses before five supersonic red rats come after you. When they start, you have no chance! They move at least twice as fast as you can, so you might as well desert the sinking ship and start another game immediately.

It is a good game, and certainly the best of Commodore's 64 bunch.

Face Ache could be the result of playing too many games in one day, but in real life it is a family entertainment game for the Commodore 64.

Back to cassettes for this one, and after waiting nearly seven minutes for the game to load, you really appreciate cartridges.

The time spent waiting can be filled up by reading the nauseatingly condescending information sheet supplied with the tape. This describes the action in words of few syllables, and in precis you are told that the screen will fill with a hilarious collection of faces. After you've managed to control your hysterical laughter, which isn't too difficult, the game proper commences.

Once again the comment has to be made that, for a graphical machine, this program does little to show you any of the features available, as everything is done in suitably chunky graphics.

Memory test

A face will appear on the screen, and after five seconds disappear again. From memory you then have to recreate the screen face using a variety of commands.

Separate keys control the hair, eyes, nose and chin, and using a combination of the lot you have to redraw the earlier face. A good memory tester with the reviewing team frequently scoring less than half marks when producing the face. However, by the time you've drawn up half a dozen different gargoyles on the screen, the interest begins to wain, and the fingers look elsewhere for something different to do.

A good game for the times amongst us, and, as a memory tester, it does have a role to play in the educational world. But first they would have to re-write the instructions, which really are quite dreadful, and perhaps do something about the graphics. They are reasonable, but the 64 could do better. Half marks for trying.

With Sea Wolf it is back to cartridges again, and just as well, otherwise a few more minutes would have been wasted.

I despair of software companies at times, and with this program being the result of a joint venture between Commodore and the electronic genius of Bally, responsible for many of our best arcade and pinball machines, there is really no excuse.

Quite simply this is appalling, and why anyone wasted money on getting it onto the market is beyond me. You are in charge of a static submarine glued to the bottom of the sea and screen, handling a limitless supply of torpedoes to shoot up at the ships passing above. Different sizes of ships score different points, and needless to say the smallest, fastest ships get you the greatest points.

Paddles needed

There is a time on the game although this can be changed if so required. Once again you have to use a set of paddles, as there are no options for keyboard or joystick control of either of the submarines in this two-player game.

I tried hard to find a redeeming feature in the game, I really did, but there just isn't one. All you have to do is sit at the bottom of the sea and launch torpedoes up at the never-ending parade of enemy ships above.

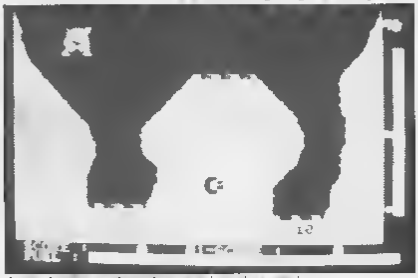
There is no radar control, no movement of your submarine, no decent sound effects, and better graphics were achieved on the earlier Commodore Pet versions of the same game (sans colour of course).

One could go on, but why bother? If this is Commodore's attempt to attack the software market, they're in for a lean winter.

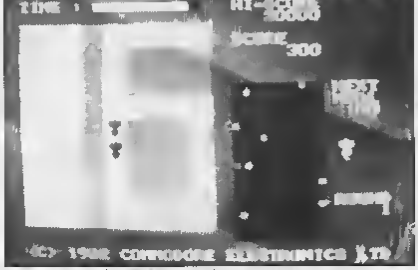
Commodore have also a series of arcade games for the Vic 20, some old, some new, but the over-riding impression of the games is that they are much better than Commodore's own games for the Commodore 64! Why, why, why?

Cosmic Jailbreak, based on the arcade game of the same name, first appeared as a Pet game in 1980, written by one Derek Hipkin. Whether he is the author of this Vic version I don't know, but this is a faithful reproduction of that Pet version.

Supplied on cartridge, you can use either the keyboard or a joystick to control the action, and for once the keyboard is just as easy to use. You are a little spaceship at the bottom of the screen who can move left and right, and who has the job of guarding a prison deep in the depths of outer space ▶



Hyperbug — [illegible] on the outside



Radar Rat Race — the action is fast and furious

◀ In this prison are three offending aliens, and they are surrounded on all sides by rows and rows of bricks. But there is a jailbreak a comin' as hordes of other aliens are lined up in formation at the edges of the screen, intent on nipping in between your fire and stealing the bricks of the jail, one at a time.

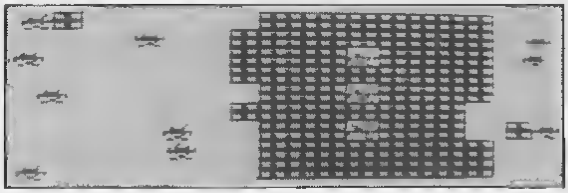
As they move back and forth they are also firing at you, and your three Space Invader type defences soon begin to crumble under the onslaught.

Occasionally one of these aliens will go beserk, and while the rest stand still will run about like an alien possessed, stealing bricks at a rapid rate. A mysterious mother ship also appears from time to time at the top of the screen. High bonuses can be achieved by zapping this one into cosmic debris.

Everything goes along at a nice lick, and by the time you arrive at level three yet more things begin to happen. Between levels the jail may or may not be rebuilt, depending on how many lives you've got left, and how many prisoners are still in the jail.

On the third level, an earwig appears directly above you, and he can only be killed by shooting him at the edge of his body. By the fifth level, a veritable chorus line of aliens is dancing above your ship, and when you eliminate all five of them, the entire lot reappear and start bobbing about again.

This is a superb game, with so much happening. Supplied on cartridge, it deserves a place in every game player's collection.



Cosmic Jailbreak: a superb game giving lots of action for your money

Omega Race is another fast action, destroy everything that moves and everything that doesn't space game for the Vic 20. Cartridge form again, and you'll need a joystick or a set of games paddles to play this one.

A nice opening feature is that you can change the background and foreground colours of the action. This could be very useful on some sets, as too many Vic games seem to appear in the strangest combinations of colours that generally render something on the screen as being totally illegible.

If you get it wrong with Omega Race you've only yourself to blame. Once you start playing you really do have to destroy everything. In the centre of the screen is a rectangular block which you can't penetrate, and underneath that is sitting a horde of aliens, just waiting to get you.

Controlling your spaceship is, to say the least, difficult. Once you've started moving in a given direction, stopping and changing direction is virtually impossible, and you just have to sit and wait while your ship blunders serenely around the screen, cannoning off walls and the block until it finally comes to a rest. That's inertia for you.

While you blunder about, the aliens come after you, and there are a number of different types of nasties, each with their own little trick up their little alien sleeves.

This game is fun, and even if you do start blithely bumping into things, it should at least provide a few laughs along the way.

By the time you've worked out how to control the ship properly (30 games later), the game does begin to make more sense, and you can get on with the job of saving the universe. Zapping different aliens generates different scores, and everything, as usual, just gets faster and faster as it goes along from level to level. Another good arcade game for the Vic. ■

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Pastern is always on the look out for any new games you might have developed

All the pleasures of printing — and some of the pain

***Pete Gerrard** assesses the range of printers on offer for Commodore users from daisywheels to dot matrix models — and offers some advice to insomniacs*

ANY COMPUTER that takes itself at all seriously can be connected to a wide variety of printers covering such diverse interfaces as IEEE RS232 and Centronics

However, earlier Commodore computers, before the company launched into the home market with Vic 20s and Commodore 64s were blessed with a peculiar version of an IEEE interface While a smart purchase would give you the opportunity of linking up to many standard IEEE printers, it would also leave you £25 worse off A little bit more expenditure could expand your world to include a veritable host of RS232 and Centronics printers, and we'll be taking a look at just some of the printers currently available later on in this article

Slow, slow . . .

Of course, you could always use Commodore's own printers, ranging from a (relatively) inexpensive dot matrix printer to a (not so relatively) expensive daisywheel printer. The speed of the latter devices must have left many people thinking that they could type faster themselves

Owners of Commodore 64s and Vic 20s were in a less fortunate position, in that the interface provided on those two computers was compatible with nothing other than Commodore s own peripherals The dot matrix printer issued by Commodore itself is not only incredibly expensive, but also very slow in operation, and very, very noisy

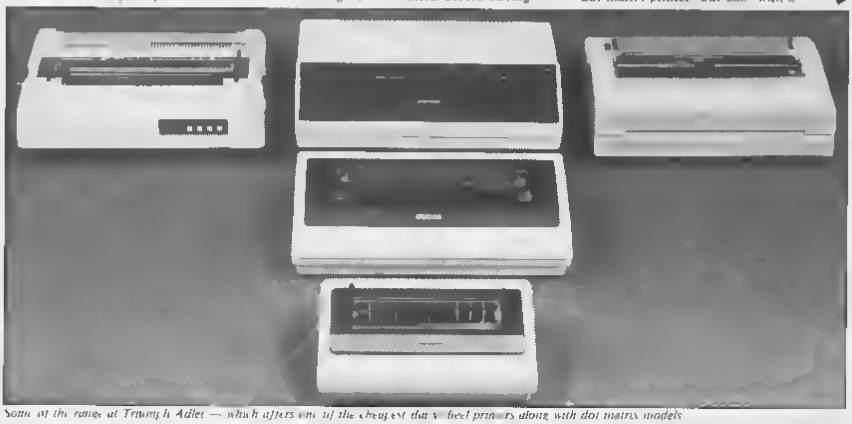
Enterprising manufacturers, ever quick to make a fast buck or two, have produced a whole collection of interfaces which allow your humble home computers to connect up to all of the interfaces mentioned earlier But beware, interface buyers, not every connector will work with every piece of software Word processors, one of the primary reasons for acquiring a printer in the first place, are very fussy about which interface you use, so insist on seeing a working demonstration before buying

The type of printer that you get will be largely determined by the work to which it will be put It it's use is to be primarily private producing listings and internal reports, the chances are that you'll be able to get away with buying nothing more than an ordinary dot matrix printer The quality of the output won't be too great, but it will certainly be legible and a good dot matrix should be able to whizz along at speeds well in excess of 100 characters a second

. . . quick, quick . . .

If the printed material is to be seen by anyone other than yourself, for instance, in a company using the printer as part of a word processing system, you ll probably have to spend rather more money and be prepared to put up with a slow, but high quality, daisywheel printer

Some of the devices now available allow you to mix these two print types to a limited extent, in that they will normally act as a dot matrix printer but can with a ▶



Some of the range of Triumph Adler — which offers one of the cheapest daisywheel printers along with dot matrix models

◀technique known as double striking (literally, printing the image twice), produce a reasonable impersonation of the type of output more commonly associated with a daisywheel printer. As ever, you pay your money and take your choice.

Few printers, other than Commodore's own, will allow you to reproduce the graphics character sets found on the actual computer, although most of them will allow you to define characters and produce, for example, dot by dot copies of the screen. However, this requires some software to be written by you, the user, so we'll stick to straightforward printers, starting with the DRH 136, which can operate in either RS232 or Centronics modes.

Incidentally, all of the printers listed here can be used with any of the Commodore range of computers. You'll just have to get the interface appropriate to your own machine.

The DRH 136, which is distributed by Triumph Adler (27 Goswell Road, London EC1), is a 120 character per second (abbreviated from now on to CPS) printer, with the ability to print bi-directionally. The number of characters printed per line is software selectable and can range from 136 to 224, although this latter mode is the type that requires an extremely powerful magnifying glass.

. . slow

All sorts of character sets are available with this printer, but at a price of £675 you may care to take a look at the slower, but cheaper DRH 80/81. Again from Triumph Adler, this is down to 80 CPS and £540. Apart from having only a 140 column line at maximum, the other real difference between this machine and it's big brother, the DRH 136, is the print speed. And, of course, the price.

Cheaper still, at £498, is the Facit 4510 from Facit-Addo (Maidstone Road, Rochester, Kent ME1 3ON). This is a 120 CPS dot matrix printer, with a column width of up to 80 characters, which is switchable down to 12 columns, should you so desire it. There's quite a wide range of character sets available, and also a number of different print modes, including condensed and compressed. This can be linked up to either Centronics or RS232 interfaces.

The next lot of printers are by Epson (Dorland House, 388 High Road, Wembley, Middlesex HA9 6UH). Epson has long been known for producing good, cheap, dot matrix printers, and its latest couple of models have done nothing to harm that hard earned reputation. Their one failing perhaps is the ludicrous combinations of letters they go under. Thus we get the RX-80-FT, which is closely related to the FX80, which in turn relates to the MX series of printers, and so on. Why can't they just have names?

Anyway, carping aside, the aforenamed RX-80-FT is a 100 CPS printer with a variety of typefaces and sizes, supplied with a Centronics interface (although this can be converted into either IEEE or RS232 if required), and capable of taking either friction feed or tractor feed.

At just £319, this is worth considering, as is its slightly more expensive big brother the FX80. This costs £438, but has the ability to print at almost twice the speed (160 CPS), and produce near letter quality output, as it's possible to double strike everything. Out of all the printers looked at here, the FX80 has got to be a personal favourite. I've owned one for a number of months and have yet to find a problem with it. The range of commands is, at times, superior to the range of commands on the computer that's driving it! A fine printer, with an excellent manual.

Possibly the fastest dot matrix printer that is readily available for any Commodore computer is the DRS 250, again from Triumph Adler. This races along at the amazing speed of 250 CPS, and comes replete with either an RS232 or a Centronics interface.

However, if the computer that you happen to own is a Vic 20 or a Commodore 64, there seems little point in paying around £200 for a computer, and then another £1 495 for the printer to go with it. Personally, when the printer costs seven times as much as the computer, I feel that the time has come to go elsewhere. If you're extremely rich, obviously the DRS 250 has a lot to recommend it. If you're like the majority of us, it's either bankruptcy — or try the Epson FX 100. This is the latest and greatest dot matrix printer to come out of the Epson stable, if the specification sheets hold true.

At £569, the FX 100 has everything that the FX80 has, including the 160 CPS print speed, optional interfaces of every kind, and superb graphical facilities, but it also has a much wider carriage. A sleek little number, it should sell by the thousand.

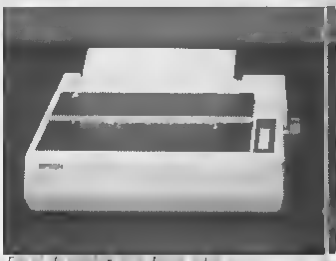
Many companies seem to make a living out of impersonating Epson printers, and indeed the early Commodore printers for the Pet range of computers were cut-down versions of Epson models. This is not a bad thing (imitation is the sincerest form of flattery, and all that), but should check whether the printer you're thinking of buying isn't already available from Epson at a much cheaper price.

Small type

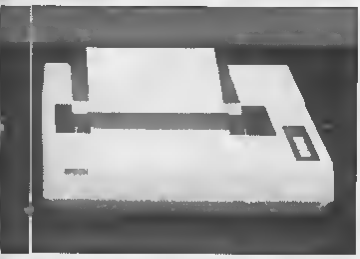
But we digress. When examining specification sheets for printers, obviously they will all try and charm you with a wonderful range of capabilities. Most printers, however, do have a failing somewhere along the line, and this is either not mentioned, printed in minuscule type, or disguised in some way.

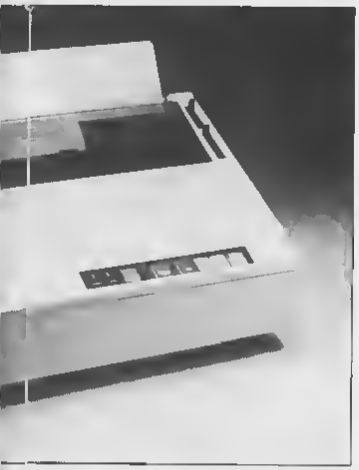
The most common failing is in speed of printing, and a phrase often used by manufacturers to hide a slow print speed is the term lines per minute, instead of characters per second. By using LPM instead of CPS they can still put down a large number, and hope that most people won't think it to be a slow printer. While 55 LPM sounds quite good, remember that a line is typically 80 characters across, and that 80 times 55 equals 4 400 characters per minute (73 CPS). This is not quite as fast as it first sounded.

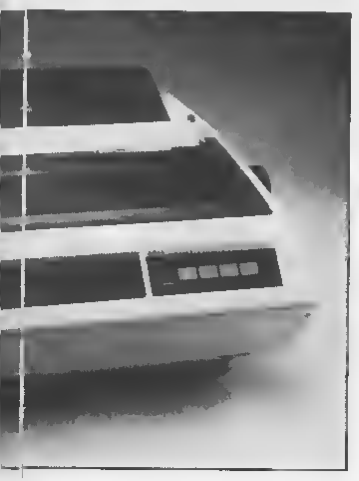
All this is by way of introducing the



Diablo 620RO, smaller brother to the 630 API







Integrex CX 80, which looks like an early Commodore printer, prints at the aforementioned 55 LPM (although to be fair it can print at 125 CPS in certain special cases, like printing line after line of the same character), and with a Commodore-compatible IEEE interface will set you back some £845

As a pure graphics printer it has many advantages over other conventional dot matrix printers, because it has a choice of seven different colours to print in, and a dot-addressable print facility However, program listings in high resolution printed in seven different colours tend to look a little odd Unless your need is a highly graphical one (in which case contact DN Computer Services, West Croft Industrial Estate Manchester Old Road, Rhodes, Middleton, Great Manchester M24 4PJ) we'll go back to ordinary printers, and look at a little number from Mannesman Tally

Mannesman was at one time supplying Commodore with printers, although I believe that agreement was discontinued a while ago Still, it is continuing to produce the MT80 which is a £799 Commmodore compatible 80 CPS dot matrix printer Mannesman seems to have gone all out to be compatible with anything else currently available, as the MT80 can handle all the Epson codes, as well as having a number of its own Any one of a million different interfaces (well, quite a few) can be hooked up to this one It is also very quiet, a boon if you happen to be next to the thing all the time it's working

Daisywheels

But enough of dot matrix printers One at least in the above collection should suit most people As many people using Commodore computers for pleasure will probably also use them for business, so we'll turn our attention to some of the daisywheel printers currently available

All of these will work with a Commodore 64 or Vic 20, provided that a suitable interface is connected (eg the Interpod — which comes from Oxford Computer Systems Hensington Road Woodstock Oxford OX7 1JR) But as most of them cost upwards of a thousand pounds they will probably be of most interest to the business user Still, if you own one of the home models and fancy a little bit of letter quality printing read on

One thing that just about all daisywheel printers have in common is that they are s-l-o-w Thus their primary use would not be in producing program listings, but in printing out letters, reports, memos, etc. You don't buy a daisywheel printer to list out adventure programs

Triumph Adler, encountered earlier when talking about dot matrix printers, produces possibly the cheapest daisywheel, the TRD 170-S, which costs £725 This is not the fastest of printers, at just 17 CPS, but it is of a high quality, and it is also quiet A maximum of 198 extremely small characters can be printed across a line and with a whole range of optional interfaces, covering Centronics, Qume and RS232, it should be able to link to just about anything

Faster, at 55 CPS, but more expensive at £1,675, is the DWP 5055, from the same company Millions of advanced features, including double print bold print, underlining, printing up to 163 characters a line, and so on, make this a versatile and fast daisywheel printer Not many models under 10 grand will print as fast as this one will

Many-coloured dreams

A company down in Woking is producing a whole range of daisywheel models, including one at just £475 However, the Getex D 14 won't win any sprints as it produces its letter quality output at the yawn-inducing rate of 13 CPS Still, you can print in either red or black, and a large print buffer compensates somewhat for the slow speed by freeing the computer to get on with some more work while everything is being printed out

The D 14 comes from Geveke Electronics (Vale Farm Road, Woking, Surrey GU21 1DW), as does the Diablo 620 RO at £975 and the Diablo 630 API at £1 650 These two are fairly similar, printing at 25 CPS and 40 CPS respectively, and including various font sizes character widths, margin controls, and so on RS232 interfaces are available on both models, but the latter scores in its graphic abilities, as it incorporates Diablo's Hyplot vector plotting — useful for all those business programs that churn out bar charts and histograms at the drop of a byte

Many other daisywheel printers are available, including the Olympia ESW 3000 RO from Intelligent Interfaces (436 Wood Street, Stratford-on-Avon Warwickshire CV37 6JQ) at £1,136 Smith Corona is another commonly encountered name, and its extremely cheap (£346) 120 words a minute TP 1 model has already found a few friends This can be obtained from Discom Trading Company Dresden House, 51 High Street, Evesham, Worcestershire WR11 4DA

Finally, at a shade under £4), is the Bytewriter (at last a printer with a name), from the same Discom Trading Company This normally comes with a Centronics interface although you can get a Commodore compatible IEEE interface fitted if desired Although it has a slow print speed of just 8 to 12 CPS it has one feature which is truly amazing at this price It is also a typewriter, having a full travelling keyboard fitted to it Since it only weighs 21 pounds, it also becomes portable rather than transportable

I've covered a reasonable range of printers, from the surprisingly cheap to the eyebrow-raising expensive, with print speeds going from snail's pace to hare's pace The rest is up to you

One final word of warning about going to buy a printer They are expensive usually costing more than the computer so you're entitled to a little bit of extra help from the shop Demand to see a working version of the set up that you will be using, including all the interfaces and all the software before parting with your hard earned cash Only that way will any last minute problems come to light ■

Cross the minefield at your own risk

PROGRAMMING

***Pete Gerrard** steers Vic 20 owners through the minefield of programming*

ONE OF THE more commonly recommended ways of learning to program is by studying someone else's programs and adopting any useful techniques that they might have used. We can follow that procedure by looking at a games program for the unexpanded Vic 20.

The game is called Minefield and the object of the game is to guide a little blob across a 9 by 10 square grid. Some of the squares on the grid have mines in them, and walking into such a square will result in instant destruction!

Rusty radar

You are equipped with a rusty radar that allows you to scan the immediate area around you. If there is a mine within one square of your present position, this information will be displayed at the top of the screen. However, it's up to you to determine which square the radar is indicating.

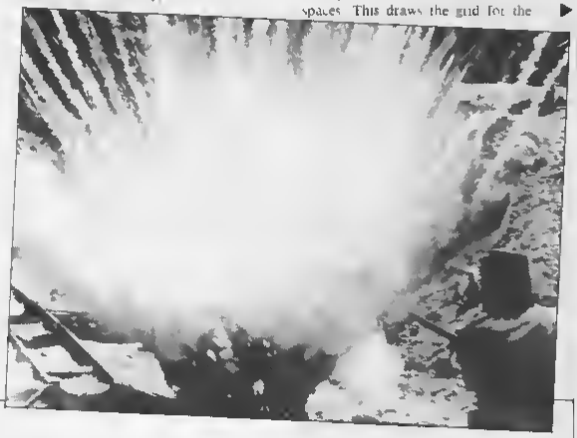
Getting successfully across the grid will send you onto the next level where there are even more hidden mines. And so it goes on, with more mines appearing all the time, until the inevitable happens and you meet your doom.

The program can be broken down into several main chunks, and the first 10 lines just clear the screen, tell you who to blame for the program, set the screen and border colours, and then go into displaying the instructions on the screen before dimensioning an array M(10,11) in line 10. This array will hold the mines information.

Line 20 contains the level counter L, and the variable J, which determines your position on the screen relative to the start of the screen memory, which on the unexpanded Vic starts at location 7680.

Lines 30 to 50 need some explanation as the printer used to produce the listing can't reproduce Vic graphic symbols. Line 30 consists of PRINTing within quotes a space, then shifted C, then a space, then shifted C, and so on, until you have 9 spaces and 9 shifted Cs. Line 53 is exactly the same as line 30.

Line 40 is PRINTing within quotes a shifted B, a space, a shifted B, a space, and so on, until you have 10 shifted Bs and 10 spaces. This draws the grid for the ▶



```
1 PRINT"[CLR]"
2 REM ******************
3 REM * BY PETE GERRARD *
4 REM ******************
5 POKE 36879,8:REM SET SCREEN AND BORDER
6 GOSUB 2000:REM RULES
10 DIMM(10,11):REM ARRAY FOR GRID
20 L=L+1:J=441
27 PRINT"[CLR,WHT]"
28 FORI=1TO10:REM PLOT GRID
30 REM SEE ACCOMPANYING ARTICLE FOR DRAWING OF GRID
40 REM MORE GRID DRAWING
50 NEXT
53 REM AND THE BOTTOM LINE OF THE GRID
55 IFEOG=1THEN RETURN:REM END OF GAME
56 POKE 7680+J,102:POKE 7680+61,42:X=2:Y=2:REM PUT YOU ON GRID
57 FORI=1TO4+L*3:A=INT(RND(.5)*9):B=INT(RND(.5)*10):M(A,B)=1:REM GENERATE MINES
58 IF(A=0ANDB=0)OR(A=9ANDB=10)OR(A=1ANDB=0)THEN M(A,B)=0
59 NEXT
60 IFX=10ANDY=11THEN5000
61 GOSUB 1500
62 Q=J
64 GETP$:IFP$=""THEN 60:REM MOVEMENT
70 IFP$='I"THEN1000:REM UP
75 IFP$="M"THEN1200:REM DOWN
```

Continued on page 20

TERMINAL SOFTWARE

commodore 64 games cassettes

SUPER SKRAMBLE!
Personal Computer News (15-21 Sept '83) gave SUPER SKRAMBLE an overall rating of NINETEEN OUT OF TWENTY and described it as "Well implemented with beautifully smooth scrolling and very nice graphics."

SUPER GRIDDER
"A compelling piece of trivia that could give hours of fun," was the verdict of Personal Computer News (21-27 Sept '83).

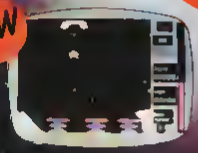
SUPER SKRAMBLE!
"An excellent game" said Computer Video Games Magazine (Sept ...)

SUPER DOGFIGHT
Your 64 games cassette has SUPERGRAMS JUST TWO PLAYER ACTION – realistic sound effects ...

TERMINAL

STELLAR DODGER
A game of skill and strategy in which you must dodge your way through asteroids to complete your mission.

NEW



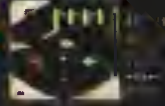
NEW

HUNTER
A fantastic game in which your passions pain in speed and intelligence are your master each ...

VIC-20 games cassettes

- Pinball Wizard
- Skramble!
- Gridder
- Line Up 4/Reversi
- Get Lost!
- Meteor Blaster
- Terminal Invaders
- Log Run
- The Crown (The Vermin)
- Rescue on Camelot Lake
- Magic Mirror
- Nostrum

PINBALL WIZARD Experience FAST and REALISTIC gravity as never before. You can even use the flippers to keep ball in the ... Enhance your skills!



REALISTIC GRAVITY!

TERMINAL

◀ game onto the screen

Line 56 positions you on the grid and places an asterisk in the top right hand corner of the grid this is the spot that you're aiming for

Lines 57 through 59 are generating the positions of the mines on the grid by producing random numbers in the range 0 through 9 for the X-direction, 0 through 10 for the Y direction, and then storing those X,Y random numbers into our M(10,11) array by putting a value of 1 into the array where the co-ordinates meet. A 0 in the array means that there is no mine at that location

Line 60 is a universal check to see if you've reached the top right hand corner of the grid. Lines 64 through 90 check for pressing of one of the four movement keys, and going to the REMmed subroutine to process moving up, down, left or right

All of these moving routines are the same in that they start by checking for the validity of a move to ensure that you don't go over the borders of the grid. They then update your position on the grid and POKE your new position onto the screen using the J variable offset from the start of screen memory at 7680. Your old position is indicated by a dot on the screen, positioned using the variable Q

Bomb search

The next step is to update your X or Y co ordinates on the grid before going to the bomb checking subroutine starting at line 1500. This checks the X and Y co ordinates of all the surrounding squares for the presence of a bomb by using the original M(10,11) array and seeing if any of the surrounding X,Y co ordinate squares contain a 1, or in other words a bomb

Line 1502 checks to see if you're on a square with a bomb in it. If you are it's off to line 3000 and a message that tells you you're dead, before showing the offending bomb's position on the grid

If you managed to reach the corner of the grid, the routine starting at line 5000 informs you of your success, updates the level counter L (so that we can have more bombs), and then resets all the bomb locations to 0, before going back to line 20 and coming up with some new bombs

The main things to look at in the listing are the way that the grid is handled and the way that the surrounding squares are checked for the presence of a bomb. The use of the array M(10,11) to hold the bomb information and the use of the X and Y co ordinates provides most of the lessons in this short program

Other things to see are generating random numbers (line 57) checking that the bomb is not placed on either the starting square, one of the squares next to it (in which case you could never start the game), and the end square, all of which is done in line 58, and the handling of key pressing in lines 64 to 90. You should also have a fun game at the end of it!

This is a special Vic 20 adaption of the original Minefield game for the Commodore 64, as published in *Using the 64*, author Peter Gerrard, publishers Gerald Duckworth ■

```
80 IFP$='A'THEN1400:REM LEFT
85 IFP$="D"THEN1600:REM RIGHT
90 GOTO 64
1000 IFJ<86THEN60
1020 J=J-44:POKE7680+Q,46:POKE7680+J,102
1022 Y=Y+1
1025 GOSUB 1500
1040 GOTO60
1200 IFJ>412THEN60
1220 J=J+44:POKE7680+Q,46:POKE7680+J,102
1222 Y=Y-1
1225 GOSUB 1500
1240 GOTO60
1400 IF INT((J-1)/22)=(J-1)/22THEN60
1420 J=J-2.POKE 7680+Q,46:POKE 7680+J,102
1422 X=X-1
1425 GOSUB 1500
1440 GOTO 60
1500 REM CHECK FOR BOMBS
1502 IFM(X-2,Y-2)=1 THEN3000
1510 X1=X+1:
1511 IFM(X1-2,Y-1)=1THENB1=B1+1
1512 IFM(X1-2,Y-2)=1THENB1=B1+1
1513 IFY<3THEN1515
1514 IFM(X1-2,Y-3)=1THENB1=B1+1
1515 X1=X
1516 IFM(X1-2,Y-1)=1THENB1=B1+1
1517 IFM(X1-2,Y-2)=1THENB1=B1+1
1518 IFY<3THEN1520
1519 IFM(X1-2,Y-3)=1THENB1=B1+1
1520 X1=X-1:IFX<3THEN1570
1521 IFM(X1-2,Y-1)=1THENB1=B1+1
1522 IFM(X1-2,Y-2)=1THENB1=B1+1
1523 IFY<3THEN1570
1524 IFM(X1-2,Y-3)=1THENB1=B1+1
1570 PRINT"[HOME]"B1"BOMB(S) 1 SQ. AWAY'
1575 B1=0
1599 RETURN
1600 IF INT((J+5)/22)=(J+5)/22THEN60
1620 J=J+2:POKE 7680+Q,46:POKE 7680+J,102
1622 X=X+1
1625 GOSUB 1500
1640 GOTO 60
1998 GETZ$:IFZ$=""THEN1998
1999 END
2000 PRINT"[CLR,WHT]WELCOME TO MINEFIELD!"
2001 PRINT"[CD]YOU HAVE TO FIND YOUR WAY ACROSS A MINE-
2002 PRINT"FIELD, TO REACH SAFETYIN THE TOP RIGHT'
2003 PRINT"CORNER OF THE SCREEN"
2004 PRINT"[CD]YOUR RUSTY RADAR ONLY SHOWS MINES THAT"
2005 PRINT"ARE ONE SQUARE AWAY : TREAD CAREFULLY'"
2006 PRINT"[CD]USE  A  TO MOVE LEFT,  D  RIGHT,  I  UP"
2007 PRINT"AND  M  DONN "
2008 PRINT"[CD]PRESS  SPACE  WHEN    READY TO START"
2009 GETSW$:IFSW$=" "THENPRINT"":RETURN
2010 GOTO 2009
3000 PRINT"[CLR]DESTROYED!"
3002 PRINT"[CD]PRESS  SPACE  TO SEE  THE BOMBS"
3004 GETSP$:IFSP$=" "THEN3008
3006 GOTO 3004
3008 EDG=1:GOSUB 27
3009 POKE 7680+J,102
3010 FORA=0TO10:FORB=0TO11
3015 IFM(A,B)=1THEMSS=A*2+1+(9-B)*44+44:POKE 7680+SS,81
3020 NEXT B,A
3040 PRINT"[HOME]ANOTHER GAME (Y OR N)"
3045 GETG$:IFG$='Y'THENRUN
3050 IFG$="N"THENPRINT'[CLR]BYE'":END
3055 GOTO 3045
5000 REM SURVIVED A LEVEL' ONTO NEXT ONE
5002 PRINT"[CLR]YOU WERE LUCKY ON     LEVEL ";L
5005 FORI=0TO10:FORK=0TO11:M(I,K)=0:NEXTK,I
5010 PRINT"[CD]BUT JUST PRESS  SPACE AND I LL PUT YOU'
5020 PRINT"ON LEVEL ";L+1
5030 GETSP$:IFSP$=" "THENPRINT"[CLR]":GOTO20
5040 GOTO5030
```

THE BEST 64 SOFTWARE

We offer the best software for the Commodore 64. Much of it comes from our own programmers, but we also market the best software we can find from other software companies. So if you want the best, take a look at our catalogue.

BUSINESS SOFTWARE

In our opinion the 64 is one of the most powerful business machines around. Don't be fooled by the price – just make the most of it! If you want a spreadsheet program that's powerful, but easy to use, try BUSICALC 2. At £69 plus VAT on tape or £71 plus VAT on disc it is much cheaper than comparable programs – and so easy to learn that you'll hardly need to use the excellent manual.

For your word processing needs we recommend VIZAWRITE. We can now offer VIZAWRITE in a cartridge at £89.95 including VAT (store text on tape or disk), or for disk users only we can offer VIZAWRITE and VIZASPELL on one disk for just £93.95 including VAT.

PROGRAMMING AIDS

If you can't afford a disk unit – but find tape loading tedious, you need the ARROW cartridge which will LOAD or SAVE programs at 7 to 8 times normal speed (programs must first be SAVED using ARROW). A bargain at £39 plus VAT.

The VICTREE cartridge has over 40 programming aid commands (including a RENUMBER that works, advanced toolkit commands, and Basic 4 disk commands) all at a new low price of £49 plus VAT. Machine code programmers will probably be more interested in our ZOOM super monitor (£10 plus VAT on tape) or our MIKRO ASSEMBLER cartridge, an easy-to-use full-featured assembler plus monitor for £50 plus VAT.

ARCADE & FANTASY GAMES

We stock some of the best games around. We reckon STIX is the best arcade game ever for the 64, but our CRAZY KONG can't be far behind. We beg to disagree with a recent reviewer about KAKTUS – the graphics are very original but if you want something really different try 3D GLOOPER, a sort of three-dimensional P#cm*n game. All these machine code arcade games cost £8.95 including VAT. At the same price you might prefer our new fantasy game with sprite graphics, HALLS OF DEATH.

SUPERSOFT

Winchester House, Canning Road, Wealdstone,
Harrow, Middlesex, HA3 7SJ
Telephone 01-861 1166

AMAZING 80-COLUMN BOARD!

We have [illegible] upgradable 40 column PETs to 80 columns – one is for small screen machines, the other for the [illegible] that can't have 80 columns are the very early calculator style machines with built-in cassette deck.

Either board costs just £[illegible], but we must know which machine you have at the time of ordering. Your computer must have Basic 4 or be upgraded to Basic 4 (the Rom set now costs £55). If you need to be able to switch between 40 and 80 columns we can provide that [illegible] for £[illegible] you can buy an extra board that allows you to switch instantly without ever opening the computer!

8032 BECOMES 8096

Our 96k expansion board for the 8032 turns it into a 8096 – yet it's less than half the size of the Commodore board!
We're using the latest 64K dynamic RAMs (as fitted in the 700 series) but they're still using 16k chips, hence the difference.

The 96k board costs £[illegible] (Remember the 8032 must be upgraded to 4k ROMs before the computer and keyboard. If you already have VIZACALC we can upgrade it – the 96k version for just £[illegible] (you would have 79k free in storage!).

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Few people would dispute that MICROSCRIPT is the best price/performance word processor for the PET. Our aim is to make it the best seller on the U.K. market. To make up for it at time we're going to make you an offer that you can't refuse.

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SUPERSOFT

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Telephone 01-861 1166

STAR GAME

Les Allen's Bomber Run turns you and your craft loose in the wild blue yonder

GO INTO SPACE ON YOUR 64

BOMBER RUN for the Commodore 64 utilises hi resolution graphics to construct a random city scape and sprites to control the plane bomb and clouds The program gives the following options joystick (port 2) or keyboard, skill level (1-5), and plane speed (fast slow)

As the plane flies back and forth across the sky your bombs must destroy the city below to enable the plane to land, re fuel and embark on another mission After each successful landings your original flight path is restored and, when applicable, your skill level is automatically increased

A score table routine is provided which lists the top 10 names against their scores During this sequence the following options are available fire button/space bar — return to game, F1 — change skill level and F7 — quit game

The program should be saved prior to running as pressing F7 activates te set mode (SYS 64738) The program also selt runs after 30 seconds

The REM statements included in the program listing should be helpful pointers in understanding how the program functions Due to the lowering of memory that takes place during the program only 153 bytes remain free Therefore, they should be ignored during programming Here is a brief listing

Please note that standard abbreviations for Basic keywords must be used in order to satisfy some line lengths These appear on pages 131 and 132 in the user manual

Here are some further notes the 64th byte is read but not used for sprite generation The pointer for protected memory is memory start/256 ie POKE 52 12288/256 The x co-ordinate of sprite (n) is controlled thus

10 for x=0 to 343
20 poke VC+2 x and 255
30 poke VC+3,y
40 poke VC+16,mt(x/256)*n
50 poke VC+21,n
60 next

(This is a revised version of a program previously published in *Popular Computing Weekly*)

```
0 ZIMBCI10 ZIMBCA 1B)
2 W=54296 WW=W+27 H1=54277 H2=54273 L0=54272 SU=54278
4 [illegible]
6 FOR [illegible] NEXT
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599 REM ****** CRASH SEQUENCE ******
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70 PORT=1700 POKE1936 191 PORTT=170000 NEXT POKE1936 150 PORTT=10000 NEXT NEXT
72 POKE1000 32 POKEVC+18 PEEK VC+18 AND253 POKEVC+21 PEEK VC+21 AND251 POKE1 0
POKE1 1
74 POKE=PEEK(1)+STEP2 V=24+ 1POKE1MOD/000
76 POKEVC+6 AND[illegible] POKEVC+4 / POKEVC+16 PEEK(VC+16)AND[illegible]/V2*[illegible] POKEVC+21 PEE
K(VC+21)AND2
78 POKEVC 1 POKEVC 15 POKEVC+29 POKEL0 7 POKEH1 120
80 POKE[illegible]TO1 NEXT POKEH1 120 NEXT POKEH1 120
82 POKE[illegible] 0 POKE(VC+21 0
84 [illegible]
86 SP=[illegible] AND 1 [illegible] 0 VSC 100
88 PRINT [illegible]TAB 13 [illegible]BOMBER POINTS "SP
90 PRINT [illegible]YOUR PLANE " PE P HELLO 000 READY "
92 PRINT[illegible]12 [illegible]
94 PRINT[illegible] [illegible] 50 START
96 PRINT[illegible]
98 IFPEEK KEY "[illegible]THENET= 0+1 GOTO100
100 IFPEEK KEY "[illegible]THEN100
102 [illegible]
104 LAN[illegible] IFLA=9THENN=[illegible] 15 LAN9 PAN9 IFRC[illegible]THENN=1
106 GOTO10
108 IF[illegible]28THENPRINTTAB(12) "TIME OVER"
110 IF[illegible]48THEN48=0 PRINT "TT" GOTO94
112 [illegible]
114 REM ****** BOMB STRENGTH ******
116 BV= BV+1+P
118 IF[illegible]5THENPONEVC+16 PEEK(VC+16)AND
120 I=INT(RND 1)*P+SP/2
122 RETURN
124 REM ****** BOMBCLEAN BUILDING ******
126 I=INT(A+ 3V 16 /A+ BV-4*16*
128 IF I/4*THENN=0 GOTO610
130 POKEVC+4 AND[illegible] POKEVC+4 BV POKEVC+21 PEEK(VC+21 AND
132 IFPEE (B)*[illegible]THEN=0 1 VC=VC+1 POKEB 32
134 IFPEEK B+40 =1 28THENPOKEB+40 160
136 IF[illegible]THENPOKEVC+21 PEEK VC+21)AND[illegible] POKEVC+16 PEEK VC+16)AND251
138 B=B+2
140 IFPC HETHENN=N+
142 RETURN
144 REM ****** CRASH SEQUENCE ******
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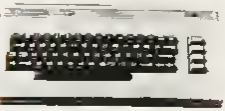
Continued on page 24

4 SPECIAL OFFER PACKAGES



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p&p code

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commodore VIC 20
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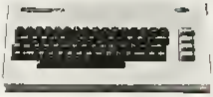

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[illegible]
REM **** CLEAR [illegible] SCREEN ****
[illegible]
REM **** SET [illegible] GAME [illegible] ****
[illegible] SKILL LEVEL  1 "
[illegible]
[illegible] PLANE  SPEED
[illegible]
REM **** TITLE PAGE ****
[illegible]
REM **** HI-RES CHARACTERS ****
[illegible]
REM **** INSTRUCTIONS ****
[illegible]
**** YOU ARE THE PILOT OF A FIGHTER PLANE ****
[illegible] IS RUNNING DANGEROUSLY LOW AND
[illegible] ORDER TO RE-FUEL  YOUR ORDERS ARE
[illegible] DESTROY  THE ENEMY CITY  BEFORE"
[illegible] AIM YOUR BOMBS CAREFULLY [illegible]
[illegible] IS ONLY  AVAILABLE AT A TIME
[illegible] SKILL LEVEL IS INCREASED AFTER
[illegible] FIVE LANDINGS    YOU MAY"
[illegible] CHANGE YOUR SKILL LEVEL UP OR  DOWN
[illegible] THE END OF EACH GAME [illegible]
[illegible] FIRE BUTTON/SPACE BAR] TO START ****
[illegible]
REM **** SCORE TABLE ****
[illegible] ENTER [illegible] FOR SCORE TABLE
[illegible]
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3 1 1 1 1
1 1 1 1 2 1
1 1 1 1 1 4
1 1 1 1 1 2
3 2 1 1 4
2 1 1 4
1 1 1 1 1 2
1 1 2 1 1
SPACES

8 - 17

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[illegible]
5039 REM **** CHANGE SKILL LEVEL ****
[illegible] RETURN
5043 REM **** RE-SET COMPUTER ****
[illegible]
5045 REM **** RESTART GAME ****
[illegible]
[illegible] RETURN
[illegible] "PRESS [illegible] TO START"
[illegible] TO CHANGE LEVEL
[illegible] PRESS [illegible] TO QUIT GAME
[illegible]
REM **** HI-RES DATA ****
[illegible]
REM **** PLANE [illegible] ****
[illegible]
REM **** PLANE [illegible] ****
[illegible]
REM **** STAR ****
[illegible]
REM **** CRASH [illegible] ****
[illegible]
REM **** CRASH [illegible] ****
[illegible]
REM **** CLOUD ****
[illegible]
6000 REM ************************
REM **** [illegible] PRINTER ****
REM **** [illegible] ONLY ****
REM ************************
REM **** LINE 12 TO READ ****
6010 REM ****   CTRL KEY 1   ****
REM ****   CTRL KEY [illegible]   ****
REM ****   CTRL KEY 4   ****
REM ****   CTRL KEY [illegible]   ****
REM ****   CTRL KEY [illegible]   ****
REM ****   CTRL KEY [illegible]   ****
REM ****   CTRL KEY [illegible]   ****
REM ****   LOAD KEY 1   ****
REM ****   CTRL KEY   ****
REM ****   LOAD KEY   ****
REM ****   LOAD KEY [illegible]   ****
REM ****   LOAD KEY 4   ****
REM ****   LOAD KEY 5   ****
REM ****   LOAD KEY [illegible]   ****
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6042 REM ************************
7000 REM ************************
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REM **** [illegible] ****
REM **** COMMODORE 64 ****
REM **** LEE  ALLAN ****
REM **** 1ST JULY [illegible] ****
REM ************************
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UTILITIES

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Comes with an extensive manual for using the package and examples of most commands. The package is written entirely in Machine Code and in no way interferes with the 64 or user's programs.
An essential utility for the 64! (£18.50)

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This package includes an Editor which accepts the usual labels and automatically renumbers the source listing where insertions are made, and a two-pass Assembler which can be halted and restarted during assembly. Also includes a monitor for saving, loading and editing Code (£18.50).

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The department which has designs on you

***Graham Cunningham** talks to **Gail Wellington** — the lady leading Commodore's software charge*

"SOFTWARE SELLS hardware' is a common enough cry these days But just six months ago Commodore president Jack Tramiel admitted 'In the past, our emphasis was on computer hardware..' He put Sig Hartmann in charge of developing software in the US and added "Today our philosophy has broadened' But the UK was already ahead of the States

Twelve months earlier Gail Wellington had taken over as software products manager in Slough As she says 'When I took over software was a small department, now there's 16 people here with more than 30 machines" And that department has designs on you

In the run-up to Christmas Commodore is launching a range of packages covering games, business and education Easy File, Fun Maths and Assembler Tutor will be out for the 64, backed up by the second part of Introduction to Basic, which has already sold well on the Vic Other business packages include Easy Stock and Future Finance Games addicts can indulge in Face Ache, Maggot Mania and Dancing Monster, while Ski, Trap and Space Snake among others are headed the way of Vic users

None of this software is written in-house As Gail says "We'll look at anything anybody wants to send us In fact Maggot Mania arrived through the post from 16-year-old Jason Perkins Commodore suggested a few improvements Jason incorporated the revisions and the finished version is now on sale Programs can arrive other ways For example, Gail first met graphic designer Paul Jay through the users' group ICPUG Face Ache is a result of that meeting

Assembler Tutor comes from Owen Murcott, an industrial training consultant, and Gail promises that this will be the one to ease the frustrations of Basic users perplexed by machine code As she says 'A lot more people are becoming interested in machine code, partly to write better games and partly to understand more about the computer' Assembler Tutor aims to turn this interest into achievement incorporating a question and answer format

Sometimes two heads can be better than one when it comes to programming — and among Commodore's software authors those two heads tend to belong to fathers and their sons Space Snake was written by John Colin, whose father is the man behind Introduction to Basic, while Future Finance comes from Finsama, a father and son team in Northern Ireland

Finsama supports a philosophy close to Commodore's heart Gail backs her president's aim of producing software for the masses — not for the classes She explains that Finsama was "thrilled to death when we brought the cost of software down — because it would make it available to more people' Gail wants to produce software that will appeal to a broad range of users — it should all be easy and fun to use, even if it's for the education or business markets However, in case Jack Tramiel's ability to turn a good quote should mislead she adds 'Of course, we'll still produce specialist software for particular applications"

Driving force

Gail thinks that Commodore's president is "an amazing person" He is the driving force behind the firm with ' tremendous instincts for the market' She adds "We see him at least every two or three months." But you hear from him a lot more often Jack Tramiel pursues a management policy of "kick em or kiss 'em If he thinks you're doing well, you'll get the praise — equally if you're not doing what he expects, you'll hear about it"

And what the president expects is more software 'We intend to be a major force in the software business, he said earlier this year and Gail is backing him all the way She supports his aggressive approach, thinking that "it's not an unreasonable way to run a business", and adds some touches of her own On her desk sits a card bearing the tongue-in cheek message "If at first you don't succeed, you're fired"

What this approach means for Commodore users is that a batch of new languages and adventures are on their way More Scott Adams adventures will be available on the Vic and some titles will be introduced on the 64 Users of both machines will also have a chance to play The Quest — a UK-produced lunch-time

Gail Wellington Commodore's UK software products

favourite already at Commodore If you've got a 64 the choice will be even wider Another UK game, Medusa's Lair, is on its way along with some celebrated American titles from Infocom, including Suspended Deadline and the Zork trilogy Strategy fans can look forward to a series of simulations starting with High Flyer (not Heathrow this time, but a big time business operator), Rail Boss and Ocean Racer — all for the 64

As for languages, "the best implementation of Logo on any micro computer" will be followed by a UK implementation of UCSD Pascal, Comal, Forth, Prolog, Pilot and a version of Cobol As the list suggests Commodore has

mun ajcr ... in terms of us in England and them over there

its eye on the education market Gail likes "selling things that have educational value" and thinks that the speech module due early next year for the 64 is ideal for primary schools A version for Vic users will follow later in the year, while talking books and programs are also on their way

Users of the 64 have more to look forward to — gaining access to CP/M-based software A Z80 card allowing this will "probably be available before Christmas" (the card is also needed to run the Cobol implementation) For 700 users the choice will be even wider a CP/M-86 card has been finalised and MSDOS is being tested now Specialised software on rival operating systems can then be used on Commodore micros, although Gail adds that "native operating system software will still run faster"

There are no plans for a second processor option on the Vic, and CP/M 86 and MSDOS will not be implemented on the 64 because its CPU is fundamentally different to the 700's However, 64 users will be getting Commodore's software answer to Apple's Lisa The price of Magic Desk has not been decided yet but Gail says "it will be in the range of all our other software" And the most expensive package she sells for the 64 costs £75

Like Lisa, Magic Desk provides pictures on the screen (called icons) identifying different items on the menu So by selecting the typewriter icon you get word processing, the telephone gives you networking, the filing cabinet gives you the database, dustbin you can guess and so on As with most of Commodore's software the package is aimed at the "average consumer" although Gail thinks small businesses would also find Magic Desk worth considering The icons have already been designed and the software to drive them "is in advanced stages of development"

Obviously things have changed since software was only a background activity at Commodore Gail is pleased with the results so far and "particularly pleased that the UK is contributing so much" Ironically, though, the voice that declares "I'm proud to be a part of the UK's success" has an American accent — a fact that surprises a lot of people when she visits Commodore in the States However, all but the accent has been assimilated She now thinks in terms of "us in England and them over there" and takes "great delight in going back to America and representing the UK software authors"

Cringe

So how do you get Gail to represent you? The answer is to do as Jason Perkins did — send your tape or disk to Commodore in Slough And don't worry about the quality of your coding, it's what your program achieves that's important As Gail says "We publish programs that would make teachers cringe — if the graphics are good, the quality of the coding doesn't matter Commodore is sent more than 100 programs a month and accepts only about 5% But every writer gets an evaluation sheet back with a detailed opinion of his submission There's no need to send a printout, but don't forget to send instructions on how to use your program

It is the successful 5% that are partly responsible for Commodore UK's software growth The company operates worldwide ("I wouldn't like to pay our international phone bill," Gail comments) but the UK plays an important role in software development In fact this month the UK is playing host to an international meeting of Commodore software managers to plan next year's strategy The message is that "the UK is small but our software contribution is large"

Thus the US will take much of the software developed in the UK, although there are differences in taste Cartridges particularly of "shoot-'em up" games, are preferred in the States Gail adds that there's more interest in games of strategy over here, but in best diplomatic manner, she stays mum about the difference in national psyche this suggests

"Shoot 'em up" or strategy, Commodore is in the software business for real now — how far will it go? Rival micro manufacturer Atari is already transporting its games to run on Commodore machines, raising speculation that Commodore might do the same in reverse There's always a chance we'll do anything" Gail says, "but we've no immediate plans on this" As she adds "My plate's full at the moment ■

MR CHIP SOFTWARE

VIC 20
GAMES AND UTILITIES

JACKPOT
This is it, the ultimate Fruit Machine for the VIC with nudge, hold and respin 100% machine code "Overall Jackpot is a beautifully written simulation giving superb graphics, animation and use of colour In fact, this program makes Commodore's Fruit Machine cartridge look unbelievably cheap and nasty" Home Computing Weekly No 20 19/7/83 **£5 50**

KWAZY KWAKS
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Guide your ever hungry snake round the screen, eating the flies and wasps, to stay alive you must avoid the deadly mushrooms quick reactions are required for this biting game, keyboard control, for the unexpanded VIC **£5 50**

BUGSY (Joystick only)
This is a minefield with a difference as you step on the stones whilst collecting purple boxes which give you both time and points, they disappear from beneath your feet DO NOT DESPAIR! "BUGSY" will randomly replace the stones but avoid bumping into him or its sudden death! An original compulsive and challenging game **£5 50**

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COMMODORE 64
GAMES AND UTILITIES

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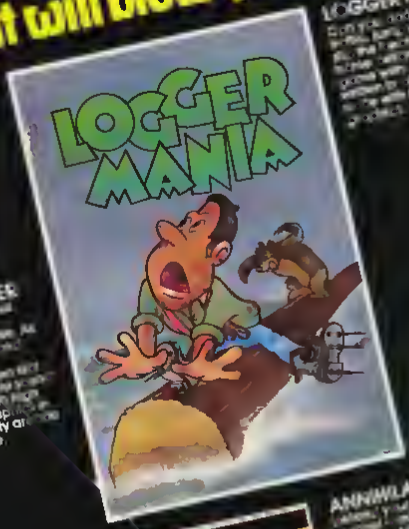

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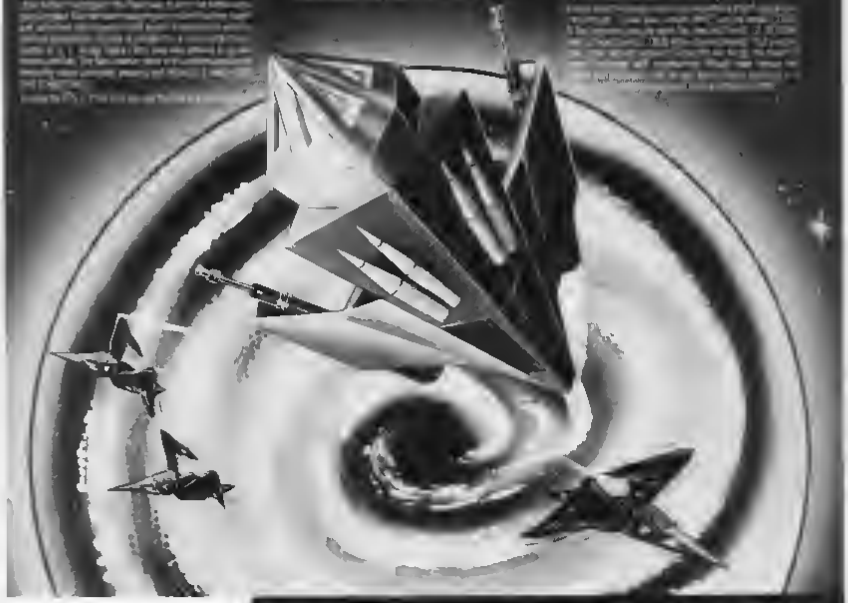
ARCADE

ARCADE



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Design your own business program

THE FIRST QUESTION you have to ask yourself is whether a computer system would be beneficial to your business On completion of my accounts system, I continued with the manual version for some months as a comparison The first, most obvious fact to emerge was the saving in time My normal five days a month were reduced by the computer to half a day, with a great deal more information than I had time to compile by the long hand method I had often heard people say "the computer is wrong again" so I was naturally wary of my results, tending to doubt the computer's if they differed to my "superior" long hand methods After being proved wrong on every occasion, I have now come to the conclusion that computers are far more suited to producing accurate accounts repeatedly

Your own system?

The second question you have to ask is whether the time spent on designing and writing your own system is justified If you require a system specific to your needs then the answer is Yes, otherwise you may have to change your routine to suit a commercially produced package There are other advantages in writing your own system such as understanding the programs in operation and being in a position to sort out problems which may be encountered If you feel you cannot spare the time required then you could consider employing someone to do it for you There are numerous amateur programmers around who would be more than willing to put their knowledge to an applied task Be prepared, however, to spend some time with your programmer as it is unlikely that you will convey sufficient information to him/her the first time round

What you'll need

Initially the purchase of a Commodore 64 and the Commodore cassette recorder for storing programs and information would be adequate for a large number of business applications and a printer and/or a disk drive could follow if required Obviously certain programs, such as word processing, would need a printer or at least access to one and there are firms who will undertake to print your script Therefore, bearing in mind those who will purchase a 64 and cassette recorder initially the programs listed here will produce the necessary information on the screen But provision has been made for each program to be expanded to include printer and disk drive routines at a later date if required

The introduction of a computer system is

PROGRAMMING

An extract from Jim Hall's forthcoming book Business Applications on the 64

likely to enhance any business — consider that by entering into the computer each transaction, or a condensed coded version, once only you will obtain a great deal of information at the end of the day, for example

- Information to produce invoices and statements
- A breakdown of customers accounts
- Complete information on all transactions to date identifying VAT for instance and also taking into account value of stock held outstanding accounts and orders, and even your overdraft
- Stock levels, updated in conjunction with customer accounts or direct sales and information on which items of stock should be re-ordered to bring the levels above a certain minimum.
- Analysis of stock movement over a specified period, facilitating planning and leading to a business being run more efficiently and economically

In fact any information you require is instantly available, bang up to-date and in any format you could wish at the touch of a button

A good impression

Consider the impression you would make on your bank manager if he rang one day concerned about your overdraft and you were able to present him with an up to the minute financial state of your business, confirmed by a typed report posted that same day

There are many books on computing, but they tend to stick to the raw facts with little imagination as to application in everyday business With this in mind, my routines aim to produce working programs in such a way that lack of programming experience is not a serious disadvantage The programs listed can be used as they are I have attempted to write them in as plain and logical a manner as possible This means that some steps are more long winded than needs be but from my own experience, I feel it is essential to produce working programs first and there is nothing to hinder you from modifying the programs at a later date as your knowledge increases I would be disappointed if I thought this work did not stimulate the reader into modifying the listings to suit his/her own application — the only limitation is your own imagination

Now down to some subroutines which will be of use in most business applications (SPC) indicates upper case space or shift key/space and it is important that this is adhered to The blanks or spaces appearing in the program should be included using the space bar key only Subroutine 1 deals with allocating arrays, setting up strings, program security, disk error channel, and checking for printer presence The first five lines although obviously not part of the subroutine explain the codes used in the program for control characters in place of graphic symbols Graphic symbols can only be achieved by dot matrix or thermal printers and not typewriter printers Note that neither the square brackets nor the code contained within should be included in a program but the relevant control character inserted instead

Setting the colours

In line 2 the two initial poke commands and chr$(144) set the screen and border colours to two shades of grey with black letters which gives reasonable contrast on a black and white TV set Chr$(14) puts the computer into lower case mode (chr$(142) = upper case mode) and alternatives to these are poke53272,23 and poke53272,21 respectively It is worth noting at this point the number 128, ie the difference between 14 and 142 This number added to or subtracted from character string codes will produce the opposite effect, ie chr$(29) cursor right and chr$(157) cursor left the difference being 128 The last poke 255 enables all the keys to repeat with continuous pressure on a key

In lines 3-6 the s6=1 variable is set to avoid the security routine (lines 14-26) when returning from the program second time round Close 15, along with open 15,8,15 in line 6, engages the disk error channel but should be omitted in tape systems The strings w1 and w2 in lines 4-5 will give a simple window/border effect when printed This draws the eyes of the operator to a question and aids concentration The addition of the program name is a constant reminder of the program running By printing w2$ the screen is cleared of all information and is useful in programming

Padding out strings

Lines 8 9 set up the variable bl$ with 60 shift/spaces and are used for padding out strings Line 10 allocates space in memory for subscripted arrays, but the numbers can be altered to suit a particular program Line 12 is needed if a computer is being used ▶

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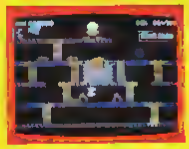

2
JUMP OVER THE PIES AS YOU RUN ALONG THE CONVEYOR BELT MAKE SURE YOU DONT END UP INSIDE THE COOKER

3
THE ONLY WAY UP IS BY THE LIFT WHICH IS UNDER A CONSTANT BARRAGE OF GIRDERS

4
KNOCK OUT ALL THE SUPPORTS BY RUNNING OVER THEM AND WITNESS THE SPECTACULAR COLLAPSE OF KONGS LAIR.

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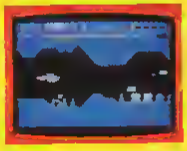
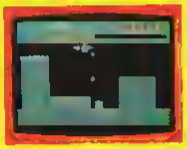


2 FIGHT COBRON QUASER ION SHIPS

3 DODGE THE FIREBALLS BECAUSE YOU CAN T SHOOT THEM DOWN

4 CITY WITH HIGH RISE BUILDINGS

5 GUIDE YOUR SHIP WITH DEXTERITY THROUGH THE MAZE



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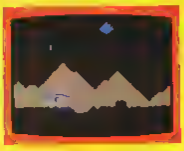

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```
1 rem ***sub 1    1 1k    commodore 64 ***
2 poke53280 11 poke53281,12 printchr$(144) printchr$(14) poke650 255:goto4
3 ad=1:close15 rem **close15 to be included using disc drive only**
4 wlp="[RVS]##########################################"
5 wf$="[CLS][RVS]Program name [SPC][SPC][SPC][SPC][SPC] [SPC][SPC][SPC][SPC]
     [SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC]
     [SPC][SPC][SPC][SPC][CR]
6 spec1,s 15:rem **rs be included using disc drive only**
8 hlp="[SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC][SPC]
     [SPC][SPC][SPC][SPC][SPC]" rem ***12 upper case spaces***
9 hlp=hlp+hlp+hlp
10 fime5$(100),ad$(100) a2$(100),ad$(600) a9$(300)
11 rem ***add command to enable or disable run/stop key with compiler***
15 printwl$:ifs=1then1000
16 print"[CR]  copyright MELAWORE to J  Robertson [CR][CR]":printwl$
15 print"[CR]  Type in 0000 to Proceed [CR][CR]":printwl$:goto21
16 printwl$
17 print [CR]You have either typed in the WRONG CODE[CR][CR][CR]"
```

```
18 print"                    "
     [CR][CR][CR]
19 print"     You are NOT an AUTHORISED User [CR]"
20 printwl$:rem j=1to3000:next j goto15
21 print"[CR][CR]                                    [CR]"
22 g$="" getg$:ifg$="":then22
25 ifg$=cr$:j(13):then25
24 rem=cr$+g$:goto22
23 ifcos="dob":then27
26 rem="" goto24
27 printw2$:print"[CR][CR]Do you intend using the PRINTER?[CR][CR]  printwl$
28 gosub202:ifj$="n":then21000
29 printw2$:print"[CR][CR]If a device not present message[CR]"
30 print"is returned then DOWNGRCT the PRINTER    and RE-START Program
     [CR][CR]
31 open4 4 print#4 ifst=-12:chkprint"[CR][CR]device not present" and
51 close4:goto1000
999 close15 ad:rem **close15 to be included using disc drive only**
```

Subroutine 1 allocates arrays sets up strings handles program security and checks for printer presence

◀With compiled programs, to enable or disable the run/stop key, specific commands are necessary and are detailed in the compiler manual

Line 13 26 deal with program security and require a known code (cos = DOB) to be entered before the program can be used

Lines 22-24 are a routine for obtaining one character at a time from the keyboard, thus creating the variable cos, and they act as an alternative to the INPUT command INPUT is a simple way of obtaining information, but offers no control over the characters typed in If a comma or colon is part of the input, any information after these characters will be ignored To prove the point try this simple program

10 input"Type in Information",a$ print a$ goto10

Type in aaa,bbb or aaa bbb and on pressing return, only the three as will be printed out and a message ? EXTRA IGNORED will appear on the screen This means that a$ = aaa only and not aaa,bbb

Using the same program press the space bar a few times followed by three Cs and press return The result is a$ = ccc — the leading spaces have also been ignored Type in b followed by a number of spaces and then c and a$ = b + blank spaces + c By holding down the shift key and pressing the space bar a few times followed by b a$ will = blank spaces + b. The golden rule, therefore, for variables which require a space as the first character, is that the space must be a shifted space This rule also applies to information obtained by the GET statement Line 22 operates by searching the keyboard buffer to see whether a key has been pressed and, if not, loops back to the beginning of line 22

In the tables on this page modes are
(CD) — Cursor Down (CU) = Cursor Up
(CR) — Cursor Right (CL) = Cursor Left
(HOME) — Cursor to Home Position
(CLS) — Clean Screen (SPC) = Shifted Space (RVS) — Reverse Field On
(RVO) — Reverse Field Off

Obviously this security system, as it stands, is limited, as anyone with program experience could easily find the code by listing the program or typing in RUN 3 and by passing the code input One method of improving the system would be to make the code cos invisible when the program was listed and this can be done quite simply by changing line 25 as follows

25print" " ifcos = "dob"then27 print"26 deletes"

To include the 26 deletes type print"" followed by moving the cursor back one place, hold down the shift key and press the inst/del key 26 times Release shift key ▶

```
197 rem ##########################################
198 rem ***sub 4.   1 1k    commodore 64***
199 rem ##########################################
200 print"[CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][CR]
     [RVS]################"
201 print [CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][RVS]$
     [RVO]Are you SURE[RVS]$"
202 print"[CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][RVS]##############
     ########
203 print"[CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][RVS]$[RVO]y for
      yes  n for no[RVS]$"
204 print"[CR][CR][CR][CR][CR][CR][CR][CR][CR][CR][RVS]##############
     ########"
205 y$= "getz$:ifz$<>'y and z$<> n'then205
206 printw2$:return
207 printwl$
208 print"[CR]**ERROR**  WRONG INPUT   Try Again"
209 printwl$:print [CR][CR]":return
210 print [CR][CR][CR][RVS]##########################################"
211 print"[CR][CR][RVS]$[RVO]****SPACE BAR Key to Continue****
     [RVS]$[RVO]'
212 print [CR][CR][RVS]##########################################"
```

```
213 a$= "ga:g$ ifg$= "then213
214 gosub[CR]:ifg=32org=140thenprintw2$ return
215 goto213
216 printw2$:print [CR][CR][CR][CR][CR][CR][CR][CR][CR]Do you
     wish to Proceed?[CR][CR][CR]"
217 printwl$ gosub202 printw2$:return
218 printwl$
219 print"[CR][CR][CR]FINISHED Adding Data to File.   Do"
220 print"[CR]you require the File to be CLOSED?[CR][CR]' gosub200:print
     w2$:return
221 printw2$:print [CR][CR]Return to MENU Program?[CR][CR]":printwl$
222 gosub202:ify$="n"thenrun3
223 printw2$:print"[CR][CR]Place MENU Tape in the Recorder [CR][CR]"
     printwl$:gosub210
224 close15 clr:print"[CLS]load +chr$(36)+"menu'+chr$(34):rem**close15
     disc only**
225 print"[CR][CR][CR][CR]run" poke198,5:poke631,19 poke632 13:poke633
     ,13 end
226 print625
227 print"[CR][CR][CR][CR][CR][CR][CR][CR][CR]Do you Require ANOTHER
     Copy?[CR][CR][CR]
228 printwl$:gosub202 printw2$:return
```

Subroutine 2 deals with some of the most common questions encountered when writing business programs

◀ and press inst/del key 26 times On listing the program, line 25 now reads print"" only, in other words the important code word (dob) has disappeared

Plugged in

Lines 27-32 make up a routine which basically, is asking whether a printer will be used in the program operation and if it is, will check whether the printer is plugged in or not Various results are obtained and it is a matter of experimentation to establish the correct routine to suit Factors affecting the routine are whether the printer is plugged directly into a computer or plugged into the back of the disk drive In line 31 command open4 4 refers to open a channel or line 4 to device number 4 Device number 4 is the code which the computer recognises as a 'printer has to be accessed" ST or status byte provides a record of the status of the system after a peripheral such as a tape recorder or printer has been accessed If all systems are correct the variable ST is returned as zero The 128 is the code for DEVICE NOT PRESENT and although a return of this error number should be intercepted, it can happen that the running program will stop and will have to be re started from scratch There is obviously little point in running a program dealing with complicated data analysis only to have the program end because the printer has not been plugged in Far better to establish this point at the very beginning

Line 9999 will end the program and close the disk error channel CLOSE 15 will close all other disk channels and should be omitted in a tape system

Subroutine 2 is a simple routine dealing with common questions which are frequently referred to and can save valuable memory space and programming time Lines 200 206 can be accessed either at line 200 or 202 depending on the type of question to be asked eg the operator has been requested to enter a data file name and gosub200 ensures that the operator checks the entry before continuing Gosub202 would be referred to for a straight YES or NO answer to a question such as DO YOU WISH TO PROCEED? gosub202 Line 205 will not accept keyboard entries unless they are either y or n Line 206 clears the screen, places the program name at the top and returns to the point after access

Program pause

Lines 210-215 provide a halt in the running program to enable the operator to place a tape in the recorder or paper in the printer Line 214 will only accept a SPACE BAR entry to continue Numerous programs request PRESS ANY KEY to continue and this is not advisable A colleague of mine included this statement routinely in his program until one day, during a demonstration of a program to a captive audience, the RUN/STOP key was entered and caused him some embarrassment It is, therefore, advisable to always specify a key entry The space bar is ideal in that it is at the bottom of the keyboard, is large and easily found by the operator This is an example of making a program interactive with the operator just as good screen display is important too

Lines 221 225 deal with the automatic loading and running of a MENU program by enquiring whether this is intended and if the answer is NO the command RUN3 is operated Use of RUN in programs will probably be frowned upon by many programmers who will decree "sloppy programming technique" They are, of course correct, but it's use is also very convenient in that all variables and arrays are cleared from memory and the program is restarted as if it had just been loaded By stipulating RUN3, the variable z6 is set to one and the code entry sequence is by passed

Lines 223 225 deal with the mechanics of loading and running the menu program CLR clears all variables from memory, the screen is cleared and load "menu" is printed on the screen followed by a four line gap and run is printed onto the screen Note the sequence to print quotation marks at menu, ie the use of chr$(34) The positive sign can be used instead of a semicolon to allow the line to be printed to the screen in sequence

The effect created by the pokes in line 255 is identical to typing load "menu" on the screen, pressing the return key, followed by run and return key as in direct mode It is possible to use the load command in the program mode, ie 3000 load "menu" However, problems can arise from this method if the program to be loaded is in fact longer than the original program ■

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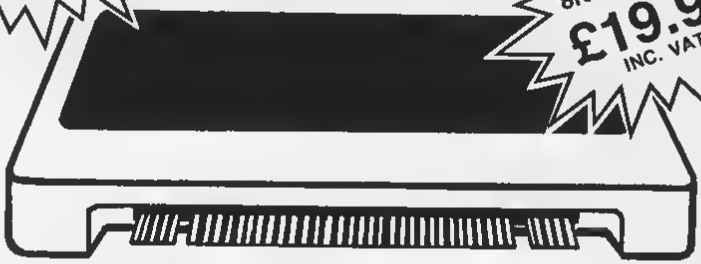

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COMMODORE SOFTWARE FILE

Moles

From Martyn Fredrickson in Norwich — for the unexpanded Vic

IN THIS GAME your job is to drop weights on moles who dare to pop their heads out of their molehills.

You can drop up to 15 weights, but you have a time limit of two minutes in which to drop them. To drop them, use the F7 function key.

There are three molehills, and the moles are constantly on the move, so even if you drop the weight down the hole, you could still miss. If you hit the mole, it is splattered, and the sound of a squelch is emitted. You will score 10 points for each you hit, meaning a maximum of 150 points. If you miss, however, a short buzz sounds, turf flies, and you score nothing.

When you run out of bombs, a short message appears, and the program reruns itself. If you run out of time, the timer buzzes, and you restart.

```
[illegible]
5 [illegible]
8 [illegible]
10 REM*****************
11 REM*               *
12 REM*     MOLE      *
13 REM*               *
14 REM*       BY      *
15 REM*               *
16 REM*     [illegible]      *
17 REM*               *
18 REM* FREDERICK[illegible]ON *
19 REM*               *
20 REM*     [illegible]      *
21 REM*               *
22 REM*****************
23 REM***TITLE[illegible]***
25 [illegible]
26 PRINT[illegible]
30 PRINT[illegible]
40 PRINT[illegible]
50 PRINT[illegible]
60 PRINT[illegible]
70 PRINT[illegible]
80 PRINT[illegible]
90 PRINT[illegible]
100 PRINT[illegible]
110 PRINT[illegible]
115 PRINT[illegible]
120 PRINT[illegible] OF 15 WEIGHT[illegible]
130 PRINT[illegible] DOWN THE HOLE.
140 PRINT[illegible] KEY [illegible] TO FLEE.
150 GET[illegible]:IF[illegible] [illegible] THEN150
160 POKE [illegible]:PRINT[illegible]
170 PRINT[illegible]
175 TI$='000000'
175 B=7722:F=0
180 PRINT'S     ***F7 TO F[illegible]***'
185 REM***MOVE [illegible]***
190 IFRND[illegible]=[illegible]THENF=1:GOTO[illegible]
192 IFTI$ = '000200' THENPRINT [illegible]        TIME UP!
193 IFTI$ = '000200' THENFORE [illegible] 1 :FOR =1TO[illegible]:FORE 1 [illegible]:NE 1 :FORE 1 [illegible]
194 IFTI$ = '000200' THENFORE [illegible] 1 :FOR =1TO[illegible]:FORE 7 :NEXT
195 FORE[illegible]
200 IFE+1 [illegible]THENFORE [illegible]
210 B=B+1:FORE [illegible]1:FORE+1 [illegible]
290 REM***MO E MOLE***
400 HH=INT RND[illegible] +1
405 FORE[illegible]
```

Continued on page 40

```
410 UHMH[illegible]TH[illegible].440 460
420 FUEE[illegible]:FUEE[illegible]+11.[illegible]
425 FUFT=1[illegible]:NE[illegible]
427 IFF=1[illegible]TU=[illegible]
430 GUTU140
440 FUEE[illegible]+5.FUEE[illegible]+11 [illegible] = 1 [illegible]
445 FUFT=1TU[illegible]:NE[illegible]T
447 IFF=1GUTU500
450 GUTU140
460 PUEE[illegible]+5:FUEE[illegible]1+1 [illegible] = 1 1
465 FUFT=1TU[illegible]:NE[illegible]T
467 IFF=1GUTU500
470 GUTU140
500 REM***UFOF BUUB***
504 IFDE=1[illegible]THENFFINT [illegible] NU MUFE EUUB[illegible]:F[illegible] T[illegible]:DE [illegible]:FUN
505 IFFEEL[illegible]E+22 [illegible]
510 IFFEEL[illegible]6+22 [illegible]
515 IFB+22 [illegible]
520 FUFEE [illegible]
530 B=B+22:FUEE [illegible]1:FUEE6+[illegible] 4
532 IF[illegible]=200THEN[illegible]=2[illegible]4:GOTU130
535 FUFES[illegible].S-1:FUFT=1TO25:NE/TT:S=S-1
540 GUTU190
600 REM***FLHT MULE***
601 FUFES[illegible].8
610 FUKEE,32:FUKE[illegible],42:FUKE[illegible]+LC[illegible]2
620 FUR[illegible]=1TO100:FUKE[illegible]4,155:NE[illegible]TS:FUKES4 [illegible]
623 FUKE [illegible],121:FUKE[illegible]+LC[illegible] 0
624 S=234
625 [illegible]C=60+10
630 FRINT'[illegible] [illegible]FUFE= [illegible]
640 DP=DE+1:GUTU175
700 REM***E[illegible]PLUDE EUNE***
701 FUKE[illegible] 0
710 FUKEE.[illegible]:P=FEEK(B+22):U=FEEK(B+21):V=FEEK(B+23)
712 FUKEP-2.46:FUKEB.46:FUKEE+2.46:FUKEB-2+LC.5:FUKEB+CC.5:FUKEB+2+LC.5
715 FUKEB+22.66:FUKEB+21.77:FUKEB+23.78:FUKEB+22+CC.5:FUKEE+21+LC.5:FUKEB+23+LC
.5
720 FUR[illegible]=1TO50:FUKE[illegible]1,175:NE[illegible]TS:FUKE[illegible]1.0
723 [illegible]=234
725 FUKEE-2,32:FUKEE,[illegible]2:FUKEB+2 [illegible]2
727 FUKEB+22 [illegible]2:FUKEB+21.32:FUKEE+22 [illegible]
730 FUKEB+22,P:FUKEB+22+CC,0
732 FUKEE+21,U:FUKEB+21+LC,0
734 FUKEE+23 V:FUKEB+2[illegible]+LC.0
740 DB=DE+1:GUTU175
```

Apple Fall

A 64 game from Gary Turner and Andrew Wilson in Macclesfield

A MONUMENTAL structure has been erected in Newton's honour but it is doomed to be bombarded by apples falling from the sky. Consequently, in order to save the masterpiece from sure destruction, a robot has been assigned to the job of catching the falling apples, thus preventing the structure from damage.

However, the robot must be quick enough to negotiate ladders and vault over gaps in order to catch the falling apple before it hits a platform. To help him in this task a transporter beam has been installed on both sides of the structure making his job easier and movement across the screen quicker.

Beware — should the robot touch the sides of the screen or fall from the scaffolding his existence will be terminated, and it is possible he may become trapped in gaps created by the falling apples. Also, once he has collected 10 apples (or less) he must deposit them in collecting baskets while the apples are still falling — so be quick.

The game is played using the joystick in port two, and to make the robot jump, the fire button must be pressed in co-ordination with joystick movement. A comprehensive set of instructions is contained within the program which incorporates sound and user defined graphics as well as the ability to change the difficulty of the game by altering the "ZZ = 1 to 7" variable in line 30 (1 to increase difficulty, 4 to make it easier —depending upon the player's proficiency).

It can be a frustrating game at the best of times so good luck — your re going to need it!

Program notes

10 GOTO line 700
20 Generates apple. Check number of apples collected
30 145 Move man. Check to see if man has hit anything
150-180 Move apple and update score
190 Sound produced when apple hits frame
200-210 Replacing character behind robot
240 260 Robot jumps left
270 290 Robot jumps right
300 310 Routine when man deposits apples
400-460 Operation of transport beam
470-490 End of game if 5 apples hit base of screen
500-590 End of game routine explosion, score, another go (Y/N)
700-1140 Instructions
1500-1650 Define characters
1700-1930 Print structure on screen
1940 Set up variables
1990 Return game to line 20

The variables are as follows
M — Position of Robot
G — Apple
AP — Number of apples collected
LI — Number of apples having reached base of screen
SC — Overall score
A — Character to be placed behind robot
B — Colour to be placed behind robot
JV — Joystick value
FR — Fire button value

```
10 GOSUB700
20 G=INT(1026+31*RND(0)) PRINT"▒                    " IFAP>10THENAP=10 IFLI>4THEN470
30 FORZZ=1TO2 POKEM,6 POKEM+CO,7 JV=PEEK(56320) FR=JVAND16 JV=15-(JVAND15)
35 POKE54296,15 POKE54277,190 POKE54276,17 POKE54278,190
40 IFJV<>0THENPOKEM,A POKEM+CO,B POKE54273,20 IFA=7ORA=8THENPOKEM,32
50 IFJV=4ANDFR=16THENM=M-1 IFPEEK(M)=0ORPEEK(M)=1THENM=M+1
60 IFJV=8ANDFR=16THENM=M+1 IFPEEK(M)=0ORPEEK(M)=1THENM=M-1
70 IFJV=1ANDPEEK(M)=2THENM=M-40
80 IFJV=2ANDPEEK(M+40)=2THENM=M+40
90 IFJV<>0THENA=PEEK(M) B=0 IFA<>32THENB=PEEK(M+CO)
100 IFJV=4ANDFR<>16THENGOSUB240
110 IFJV=8ANDFR<>16THENGOSUB270
120 IFPEEK(M+40)=32THENPOKEM,32 M=M+40 POKEM,6 POKEM+CO,7 GOTO120
130 IFA=5THENGOSUB300
135 IFM=1665ORM=1662THENGOSUB400
140 IFPEEK(M+40)=8ORA=8THEN500
145 POKE54273,0 NEXTZZ
150 POKEG,32 G=G+40 IFPEEK(G)=6THENAP=AP+1 POKE54273,40 A=32 POKEM,32 GOTO20
160 IFPEEK(G)<>32THENPOKEG,32 POKEG+40,32 GOSUB190 GOTO20
170 IFG>1943THENLI=LI+1 GOTO20
180 POKEG,7 POKEG+CO,10 PRINT"▒"SC,"    "AP,"  " GOTO30
190 POKE54296,15 POKE54277,190 POKE54276,33 POKE54278,190 POKE54273,10 RETURN
200 A=PEEK(M) B=0 IFA=32THENRETURN
210 B=PEEK(M+CO) RETURN
240 IFPEEK(M-41)=0ORPEEK(M-41)=1THENRETURN
245 POKEM,A POKEM+CO,B M=M-41 GOSUB200 POKEM,6 POKEM+CO,7
250 IFPEEK(M+39)=0ORPEEK(M+39)=1THENRETURN
260 POKEM,A POKEM+CO,B M=M+39 GOSUB200 POKEM,6 POKEM+CO,7 RETURN
270 IFPEEK(M-39)=0ORPEEK(M-39)=1THENRETURN
275 POKEM,A POKEM+CO,B M=M-39 GOSUB200 POKEM,6 POKEM+CO,7
280 IFPEEK(M+41)=0ORPEEK(M+41)=1THENRETURN
290 POKEM,A POKEM+CO,B M=M+41 GOSUB200 POKEM,6 POKEM+CO,7 RETURN
300 IFAP<1THENRETURN
310 POKE53280,10 FORI=1TOAP AP=AP-1 SC=SC+1 NEXT POKE53280,11 RETURN
400 IFM=1665THENM=1661 POKE1665,8 POKE1665+CO,8
410 IFM=1662THENM=1666 POKE1662,8 POKE1662+CO,8
420 POKE54277,130 POKE54276,33 POKE54278,190
430 FORZ=0TO40STEP.5 POKE54273,Z NEXTZ
440 POKE54277,0 POKE54276,0 POKE54278,0 POKE54273,0
450 A=2 B=0 RETURN
470 PRINT"♥" POKE53280,0 POKE53281,0 POKE53272,21
480 PRINT"▒▒▒▒▒▒▒▒       5 APPLES HAVE REACHED THE"
490 PRINT"▒          BOTTOM OF THE SCREEN"
495 FORI=1TO1000 NEXTI
500 POKE54277,130 POKE54276,129 POKE54278,190 POKE54273,6
510 FORX=15TO0STEP-.3 FORZ=1TO20 NEXTZ POKE54296,X NEXTX
520 POKE54277,0 POKE54276,0 POKE54278,0 POKE54273,0
530 PRINT"♥" POKE53280,0 POKE53281,0 POKE53272,21
540 PRINT"▒▒▒▒        YOU SAVED▒".SC."▒APPLES"
550 PRINT"▒▒▒▒▒▒▒▒▒         ANOTHER GO(Y/N)"
560 GETP$
570 IFP$="Y"THENGOSUB1700 GOTO20
580 IFP$="N"THENPRINT"♥BYE." END
590 GOTO560
700 PRINT"♥" POKE53280,0 POKE53281,0 PRINT"▒                ▒APPLE FALL▒"
710 PRINT"▒▒▒   ▒THE OBJECT OF THE GAME IS TO PROTECT"
720 PRINT"YOUR CLIENTS SCAFFOLDING FROM DAMAGE BY"
730 PRINT"MANOEUVRING YOUR ▒AUTOMATED APPLE CATCHER"
740 PRINT"▒(A.A.C.)AROUND THE STRUCTURE.POSITIONING"
750 PRINT"▒IT BENEATH THE FALLING APPLES ENABLING"
760 PRINT"IT TO COLLECT THEM."
770 PRINT"▒▒▒   ONCE YOUR ROBOT HAS COLLECTED ITS "
780 PRINT"10 APPLES CAPACITY (OR LESS) IT MUST"
790 PRINT"DEPOSIT THEM IN THE COLLECTING BASKET AT"
800 PRINT"▒THE TOP OF THE SCAFFOLDING ON EITHER"
```

Continued on page 42

```
810 PRINT"SIDE OF THE SCREEN. HOWEVER,SHOULD ANY"
820 PRINT"APPLES ESCAPE YOUR 'R.A.C.' AND HIT THE"
830 PRINT"SCAFFOLDING THEY WILL CAUSE EXTENSIVE"
840 PRINT'DAMAGE MAKING YOUR TASK EVEN HARDER."
845 PRINT"[illegible]  [illegible]HIT A KEY TO CONTINUE"
846 IFPEEK(197)=64THEN846
850 PRINT"[illegible]  SHOULD THE SCAFFOLDING BE DAMAGED IN"
860 PRINT"SUCH A WAY THAT IT IS IMPOSSIBLE TO MOVE"
870 PRINT"[illegible]FROM ONE SIDE TO THE OTHER ACROSS THE"
880 PRINT"STRUCTURE,YOU WILL BE FORCED TO USE"
890 PRINT"THE TRANSPORTER BEAM ([illegible]) WHICH WILL"
900 PRINT"MAKE YOU APPEAR AT THE TWIN BEAM ON THE"
910 PRINT"OTHER SIDE OF THE STRUCTURE.YOU MAY MOVE'
920 PRINT"[illegible]TO EITHER SIDE USING THIS METHOD."
940 PRINT"[illegible]  [illegible]THE ANTI THEFT DEVICE SURROUNDING THE"
950 PRINT"SCAFFOLDING ([illegible]BLUE[illegible]) IS LETHAL TO YOUR"
960 PRINT"ROBOT SO IF HE FALLS THROUGH THE"
970 PRINT"SCAFFOLDING ONTO THE FLOOR,OR STRAYS TOO"
980 PRINT"[illegible]AR WHEN DEPOSITING HIS APPLES - [illegible]ZAP!!"
985 PRINT"[illegible]WARNING [illegible]IF [illegible] APPLES HIT THE FLOOR THEN"
986 PRINT"[illegible]  [illegible]ZAP!!!"
990 PRINT"[illegible]  [illegible]HIT A KEY TO CONTINUE"
1000 IFPEEK(197)=64THEN1000
1010 PRINT"[illegible]  THE SCORE IS DISPLAYED IN THE TOP LEFT"
1020 PRINT"[illegible]HAND CORNER OF THE SCREEN ALONG WITH"
1030 PRINT"THE NUMBER OF APPLES YOUR ROBOT IS"
1040 PRINT"CARRYING-(SCORE LOAD),YOUR FINAL SCORE"
1050 PRINT"IS THE NUMBER OF APPLES DEPOSITED IN"
1060 PRINT"THE COLLECTING BASKETS DURING THE GAME."
1070 PRINT"[illegible]  [illegible]MOVEMENT"
1080 PRINT"[illegible]  USE JOYSTICK IN PORT 2 TO MOVE -"
1090 PRINT'          UP DOWN LEFT RIGHT."
1100 PRINT"[illegible]  [illegible]THE FIRE BUTTON ENABLES THE ROBOT TO"
1110 PRINT"JUMP A ONE SPACE GAP IN WHICHEVER"
1120 PRINT"DIRECTION IT MAY BE TRAVELLING,PROVIDING"
1130 PRINT"[illegible]THERE IS SUFFICIENT HEADROOM."
1140 PRINT'[illegible]  [illegible]GOOD LUCK!!!"
1500 POKE56334,PEEK(56334)AND254 POKE1,PEEK(1)AND251
1510 FORI=0TO511 POKEI+12288,PEEK(I+53248) NEXT
1520 POKE1,PEEK(1)OR4 POKE56334,PEEK(56334)OR1
1530 FORCHAR=0TO8
1540 FORBYTE=0TO7 READN POKE12288+(8*CHAR)+BYTE,N NEXTBYTE NEXTCHAR
1550 DATA255 255,255,255 255 255,255,255
1560 DATA129 66,36,24,24,36,66,255
1570 DATA255,129,129,129,129 129 129,129
1580 DATA192,192,192,192,192,192,192 192
1590 DATA3,3 3,3,3 3,3,3
1600 DATA255,255,66,102,36,60,24,24
1610 DATA129,129 66,231,153,153 102,66
1620 DATA0 36 126,126,126,126 60,0
1630 DATA255 255,255,255,255,255,255,255
1640 PRINT"[illegible]  HIT A KEY TO PLAY THIS ACE GAME"
1650 IFPEEK(197)=64THEN1650
1700 POKE53272,29 PRINT"[illegible]" POKE53280,11 POKE53281,11 PRINT"[illegible]" CO=54272
1710 PRINT" [illegible]E                                    E'
1720 PRINT" [illegible]B                                    [illegible]B"
1730 PRINT' [illegible]B                                    [illegible]B"
1740 PRINT"  [illegible]P                                   [illegible]P"
1750 PRINT"  [illegible]P                                   [illegible]P"
1760 PRINT"  [illegible]P                                   [illegible]B"
1770 PRINT"  [illegible]P                                   [illegible]B"
1780 PRINT"  [illegible]B                                   [illegible]B"
1790 PRINT"  [illegible]B      B[illegible] [illegible]  [illegible]          [illegible]B B"
1800 PRINT"  [illegible]B      [illegible]AAA AAAAA AA[illegible]P      B[illegible]B [illegible]B B"
1810 PRINT"  [illegible]B      B      [illegible]       [illegible]P[illegible]  [illegible]P[illegible]B    B B"
1820 PRINT"  [illegible]P      B      [illegible]       [illegible]AAAAAA [illegible]B   B    B [illegible]H"
1830 PRINT" [illegible]H[illegible]P      B B[illegible] [illegible]  [illegible]B       B   B[illegible] [illegible]P[illegible]"
1840 PRINT' [illegible]P [illegible]B[illegible] [illegible]AA [illegible]B[illegible]AA [illegible]B [illegible]AA [illegible]B [illegible]  [illegible]B[illegible]AA [illegible]B[illegible]AAA"
1850 PRINT" [illegible]AA[illegible]P [illegible]AA[illegible]AA [illegible]B [illegible]C    [illegible]B    [illegible]AA[illegible]P [illegible]AAA  [illegible]B    B"
1860 PRINT"    [illegible]B    B   B [illegible]C    [illegible]B       B [illegible]C      [illegible]B    B'
```

```
1070 PRINT"    ■B    B  B ■■■■■■■■■    ■B ■C       ■B    B"
1880 PRINT"    ■■■■■■■■■ ■■■■■■■■■    ■■■■■■■ ■■■■■■"
1890 PRINT"    ■■■■■■■■■ ■C          ■D    ■■■■■■■■ ■■■■■■"
1900 PRINT"    ■C          D C       D    C     D C     D"
1910 FORI=1024TO1944STEP40:POKEI,0:POKEI+CO,6:NEXT
1920 FORI=1063TO1983STEP40:POKEI,8:POKEI+CO,6:NEXT
1930 FORI=1984TO2023:POKEI,8:POKEI+CO,6:NEXT
1940 A=32:AP=0:SC=0:M=1828:LI=0
1990 RETURN
```

Light Sound

From Richard Barton in Dagenham — for the Vic 20 with Super Expander

THIS PROGRAM generates music in four parts and full colour graphics in grids, circles, triangles, etc. The choice of graphic shape is dependent upon the musical notes chosen and they are overlaid one upon the other in different colours.

The program is for the Vic 20 plus Super Expander.

```
10 REM LIGHT & SOUND
12 REM R.BARTON.1983
14 GRAPHIC2
20 S1=36874:S2=36875:S3=36876:
   S4=36877:V=36878
30 POKEV,5
50 FORRP=1TO8
60 CO=INT(RND(1)*15)
70 COLORCO/2,0:CO,0
80 A=INT(RND(1)*127)+50
90 B=INT(RND(1)*127)+25
100 C=INT(RND(1)*127)+125
110 D=INT(RND(1)+127)+125
120 TD=INT(RND(1)*900)+1
130 E=INT(RND(1)*1020)
140 F=INT(RND(1)*1020)
150 G=INT(RND(1)*1020)
160 H=INT(RND(1)*1020)
170 POKES3,A
180 DRAW2,E,F:TOG,H:TO500,1023:TOE,F
190 FORT=1TOTD:NEXTT
200 POKES2,B
210 POKES1,C
220 FORT=1TO(TD/5):NEXTT
230 IFTD<50THENPOKES4,D
240 IFCO=1THEN CIRCLE2,E,F,G,H
250 IFCO=0THENGOSUB330
260 IFA<130THENGOSUB570
270 IFTD>890THENGOSUB410
280 IFTD<10THENGOSUB460
290 FORT=1TO(TD/2):NEXTT
300 POKES4,0:NEXTRP
310 SCNCLR
320 GOTO50
 30 FORGR=10TO1020STEP50
340 DRAW2,0,GR:TO1023,GR
350 NEXTGR
360 RETURN
370 FORGR=10TO1020STEP50
380 DRAW2,GR,0:TOGR,1023
390 NEXTGR
400 RETURN
410 FORCR=10TO500STEP50
420 CIRCLEOVER2,500,500,CR,CR
430 NEXTCR
440 POKES1,0:POKES2,0:POKES3,0:POKES4,0
450 RETURN
460 RG=INT(RND(1)*1000)
470 IFRG<500THEN FORGR=RGTO500:STEP20
480 IFRG>500THEN FORGR=RGTO500:STEP-20
490 DRAWOVER2,500,500TORG,GR
500 NEXTGR
510 RETURN
```

Creating 3D graphics

For the Super Expanded Vic — from Marc Sinclair, London SW2

ALTHOUGH SMALL this program creates a 3D pattern on the Vic 20 high resolution screen.

```
MARC SINCLAIR

0 GRAPHIC2:COLOR6,6,1,1:FORA=0TO420STEP1
0 B=SIN((A)/50)*100:CIRCLE2,512,B+500,A,
A:NEXT
1 END
```

Send us your Commodore programs, enclosing a cassette — and a printout on plain white paper if possible. Each listing must be accompanied by a typewritten introduction describing the program and explaining how it is constructed. We pay £6.00 for each bug-free listing published. We cannot guarantee to return every program submitted, so please keep a copy. If you want us to return your listing you must include a stamped addressed envelope. If you have any problems with the programs, please write to the appropriate author. Software File, Commodore Horizons, 12-13 Little Newport Street, London WC2R 3LD.

First steps on the road to robot building

The first few stages in constructing turtles and micromice may be inexpensive but not without the occasional stumbling block, as Dr John Billingsley explains

STEPPER MOTORS are a favourite actuator for obtaining motor output. Their drives involve only logic signals, with no need for digital-to-analogue conversion. Until recently only precision 'upper-class' motors were available at an outrageous price but with the microcomputer and a requirement for low-cost peripherals there has come a demand for cheap stepper motors which the industry has been swift to fulfil. A suitable motor for turtles and micromice is the Philips ID35, distributed by Impex of Richmond at around £12.00.

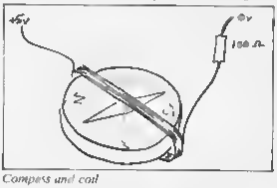
Despite their apparent advantages, stepper motors are not without their problems. They have a firm restriction on their top speed, and the useful torque falls off dramatically as this is approached. Sudden speed changes even at relatively low speeds, can stall the motor. Unfortunately, unless special sensors are added the computer is unaware that the motor has slipped 'out of cog'. All subsequent movements therefore take place with a position error, until a reset manoeuvre is made. Another drawback in a battery-driven system is power consumption: even when stationary a stepper draws as much power as under full load.

Down to work

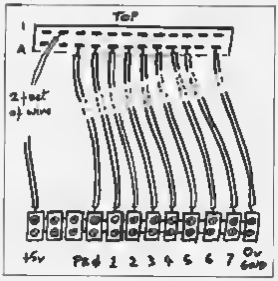
Just how does a stepper motor work? The rotor is a permanent magnet, while the stator (the fixed case) has a number of electrical windings which when energised create a magnetic field. The field pulls the rotor into line, and by changing the selection of energised windings in a suitable sequence, the rotor is pulled round step by step. When the stepping stops, the rotor is held in position by the magnetic field.

The movement of the permanent-magnet rotor can be likened to the rotation of a magnetic compass — indeed you can use a compass in an experiment to demonstrate how a stepper motor operates. Obtain a cheap compass — the simple sort with a pointer rather than an ornate card will be best. Wind a coil of 50 turns of fine enamelled copper wire — 36 swg or finer — across the compass — obviously the wire must not obscure the view of the needle. Connect a 47 ohm resistor in series with the coil, and apply 5v across the ends. You will find experimenting much easier if you connect the user port to a "chocolate-block" terminal strip, as shown in Figure 2. You can now find 5v and ground on the connector strip.

When the voltage is applied, the needle should rotate and line up almost perpendicular to the coil, ie along the axis of the coil. Reverse the applied voltage and the needle will reverse. Could the coil, and hence the needle, be driven directly from two bits of the user port? Unfortunately the current available from PBO-7 is limited to about three milliamps and unless you are prepared to wind coils of several hundred turns this will not dominate the effect on the needle of the earth's magnetic field. We must therefore use some amplification — no bad thing in preparing to drive genuine stepper motors. The simplest amplifier consists of just one resistor and one transistor per bit of output — four of each per motor. (Later on we can consider using a Darlington driver chip instead.) A good general purpose PNP transistor is a 2N 3703 (RS 294-334) costing well under £1.00 per pack of five.



Compass and coil



User port to connector strip

First connect just one transistor to your coil, driving it from PBO via a 1 kohm resistor as shown in Figure 3. Connect the circuit and switch on. Nothing should happen to the compass at first. Set the output data register to all bits high by typing POKE 56577,255. Then configure bits 0-3 as outputs by typing POKE 56579,15. Still nothing should happen, because the output of PBO is high, and does not yet sink any current via the transistor base. Now type POKE 56577,255-1. This will take PBO to zero and current will flow into PBO from +5v through the transistor base and R1. The transistor will be turned on, applying 5v from the transistor collector to the coil and resistor. The needle should leap into action. Turn the current off again with POKE 56577,255 before the resistor R2 starts cooking.

To reverse the needle, we must be able to pass current in the opposite direction. With a circuit as simple as this one, we cannot reverse the current in the wire, and so we need a second coil, would directly over the top of the first. Wind a further 50 turns of wire, connecting one end to the resistor, and winding in a direction such that the two joined wires become the half-way point of the coil which now has 100 turns. Connect a twin of the transistor circuit and drive it from PB1, as in Figure 4.

Mercy

Now the commands POKE 56577,255-2 followed by POKE 56577,255-1 should drive the compass needle first one way (north, say) and then the other (south). Another command POKE 56577,255 will switch off both arms of the coil, and the compass will be left to the mercy of the earth's field.

So far messing about with a compass does not seem to have much to do with motors. But now the plot gets more exciting. Wind another twin coil, also of 50+50 turns, over and perpendicular to the first coil. Now when the new coil is connected via two more transistors and driven from PB2 to PB3 the command POKE 56577,255-4 will cause the needle to point in the new direction. If the first coil caused the needle to point north or south then the second coil causes the needle to point east or west. By switching on one of the N-S coils and one of the E-W coils together we can also obtain NE, SE, SW and NW (see Figure 5).

Speed and acceleration control

Enter and run the following program

The compass needle should now rotate if somewhat jerkily acting as a stepper motor.

Now you can try a variety of numbers in line 200 to set the speed of the motor. You will find that if you aim too high, the ▶

Here's my classified ad.

(Please write your copy in capital letters on the lines below.)

£0.20	£0.40	£0.60	£0.80
£1.00	£1.20	£1.40	£1.60
£1.80	£2.00	£2.20	£2.40
£2.60	£2.80	£3.00	£3.20
£3.40	£3.60	£3.80	£4.00
£4.20	£4.40	Please continue on separate sheet if required	

I make this _____ words, at 20p per word so I owe you £ _____

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.....

.....

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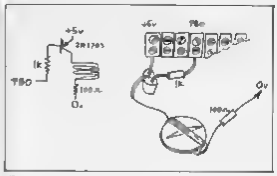
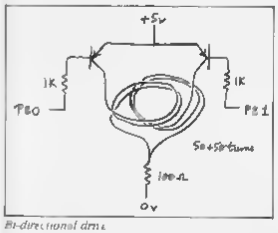
Please cut out and send this form to Classified Department, Commodore Horizons, 12-13 Little Newport Street London WC2R 3LD



Transistor drive



Bi-directional drive

◀motor will not start Try accelerating steadily by making the following changes

```
5 V=2000
200 FOR I=1 TO 20:NEXT
210 V=V-1
220 IF V<50 THEN V=50
230 RETURN
```

Now the delay will reduce progressively until the top speed is reached Try various values in line 220 The speed will climb very slowly, rushing at the end A steadier speed-up can be obtained with

210 V=V*.995

You are now experimenting with techniques which you will need when you graduate to a genuine stepper motor Of course the program is still grossly inelegant, and is not exactly versatile Nevertheless the compass motor will already have taught you some of the pitfalls to look for

1 Without drive, the motor does not retain its position

2 Settling to a new position takes the form of a poorly damped oscillation At certain stepping speeds there is a resonance so that the oscillations build up — the motor then stalls

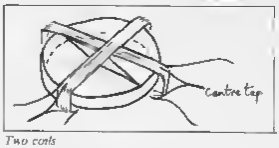
3 Movement at low speeds is "lumpy" This can be improved somewhat by doubling up on the applied steps so that the sequence is N, NE E, SE S SW, W, NW and back to N

4 Sudden changes of speed will stall the motor

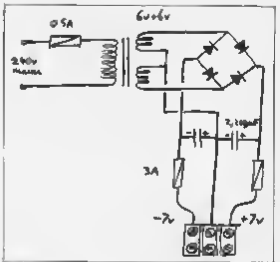
5 There is no absolute position references — everything depends on the motor keeping in step

Now let us try to introduce some style into the software, so that it will be of more general use The codes which determine the coil polarities are best held in an array I have a personal preference for putting all initialisation data at the end of the program so that it does not obscure listings of the functional part Thus the program will start with GOTO 10000 and all definitions will start at line 10000

```
10000 DIM DR(8,4):FOR I=1 TO 8:READ DR(I,0):
10010 READ DR(I,1),DR(I,2),DR(I,3):NEXT:REM
10020 DATA 1,0,4,0
10030 DATA 0,0,4,0,0,0,4,0:REM ADD POINT
10040 GOTO 1
```



Two coils



Simple power supply (components from RS)

If the number of steps to move is held in variable D1 (distance), while the direction is held in RO (rotation) as a ±1 and if the current position is held in HEre, then an appropriate section of program to command the movement could be

200 GOSUB 5000 REM MOVE DISTANCE, ROTATION, SPEED

where the subroutine has been defined as

```
5000 IF D1<>0 OR RO<>0 THEN RETURN
5010 FOR I=1 TO D1
5020 HE=HE+RO:REM ADD ROTATION TO HERE
5030 POKE PB,DR(HE MOD 7)  REM OUTPUT CODE TO PORT
5040 FOR J=1 TO 10*V: REM SPEED
5050 NEXT I
5060 RETURN
```

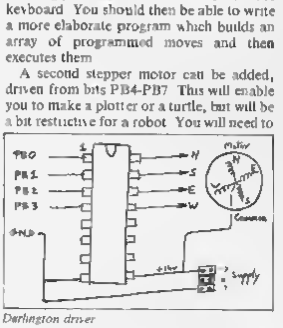
The variable delay of line 5040 might appear a clumsy way to set the speed but it is effective unless the value of SPEED is excessive A more elegant technique is that of the binary-rate-multiplier This is useful for coordinating the movements of several steppers, but because of an uneven stepping rate the top speed is reduced

To complete this program you can add

```
1 GOTO 1:REM
1 ? PRINT "DISTANCE, ROTATION DIRECTION SPEED"
11 ?:INPUT D1,RO,SP
10 GOSUB 5000
11 GOTO 1
```

and you have a demonstration program enabling you to command a move from the keyboard You should then be able to write a more elaborate program which builds an array of programmed moves and then executes them

A second stepper motor can be added, driven from bits PB4-PB7 This will enable you to make a plotter or a turtle, but will be a bit restrictive for a robot You will need to



Darlington driver

use some clever addressing techniques if up to eight motors are to be commanded from a single user port

Before going into any more software detail, let us consider the electronic problems of interfacing one or more genuine stepper motors to the computer. The principles remain the same, but we must now be able to supply much greater currents These are beyond the permitted drain which can be taken from the micro, and so a separate supply must be provided You should be able to buy a 1 ampere supply, variable from 4 to 10 volts, for under £30 00 Even so, this is scarcely enough current — although an overload will merely "fold back" the output The best answer may be to build the unstabilised supply shown in Figure 6 which will give around three amps output at +7v and −7v Many stepper motors will require 12 volts or more to give of their best, and the power supply can be connected to give a single 14 volt supply — just by using the −7v terminal as the negative connection and ignoring the centre terminal

A lazy but *risky* alternative is to take your life in your hands and use a motor-car battery charger This will probably give you up to four amps, but will need a large external capacitor — 10 000 microfarads or so It will also give poor regulation, and will put nothing better than a four amp fuse between your circuitry's well being or annihilation Still, it's better than buying an endless supply of batteries, unless you can afford rechargeables

The simple transistor will hardly have enough "beta" to drive a stepper motor from the earlier circuit However, you can buy Darlington transistors with much higher gain They are in fact a pair of transistors in cascade, but have the disadvantage of a higher "bottoming" voltage — they are less efficient in low voltage circuits Nowadays it is much more economic to buy multi function chips than to buy individual transistors, and the RS 307-109 chip contains seven Darlingtons complete with input resistors and protection diodes, for well under £2 00 However, Murphy's Law gets you because to drive two stepper motors you need eight outputs, not seven

Incinerated

Another complication is that these circuits are "sinks", not sources The common point of the motor windings must therefore be connected to the positive supply, and the winding will be energised when the user port output bit is high, not low The line of the computer program setting up the output patterns will have to be changed, to become

10010 READ J DRIVE(I)=J:NEXT I

Moreover the program will have to poke 56579 with 15 or 255 as early as possible, so that zeroes will be output and the motor not be incinerated under double its fair share of active currents

With the change to the program described above, and with the circuit shown in Figure 7, you should be confident of your ability to drive stepping motors and should be ready to build a simple turtle ■

DISPLAY AD INDEX

ANSWER BACK

Looking for a good book

COULD YOU please tell me whether it is possible to obtain a book about high resolution graphics on the unexpanded or expanded (16K) Vic 20

Also could you tell me if there is a book about machine code available and, if so, from where

A Grimshaw
Richmond upon Thames

AS YOU probably know there is a great range of books available covering most aspects of the Vic 20 Many of these, however are barely worth looking at, especially most of the games books

For a start on programming in high resolution graphics it is probably best to try and work your way through the Commodore Vic 20 *Programmers' Reference Manual*

When it comes to machine code programming the best book is probably Dr Watson's *Beginning Assembly Language Programming on the Vic 20*

Calling Micronet

I WOULD like to know when and if there will be a modem forthcoming to allow the Vic 20 to access the Micronet 800 service

I understand the BBC and ZX Spectrum micros have had modems introduced, but have heard nothing about a Vic 20 modem Is the Vic 20 screen display impossible to change to a Prestel compatible display? Will there only be a modem for the CBM64? Please help

Andrew Lewis
Camarthen
Dyfed

AT THE moment there are only plans to introduce a CBM 64 version for Micronet 800 The feeling seems to be that the Vic 20 is not going to be around much longer, at least not long enough to make it worth investing in the design and manufacture of a modem connection

Do not however, be too disappointed Although Micronet is an admirable idea, and has many applications for a business user, it does have many disadvantages for the home user

It is relatively expensive to a) buy the modem b) become a subscriber to the service and c) pay all the phone bills which go with regular access to the information There is not as yet a great deal of useful material on the service and it is frustratingly slow to download any software We also feel that many home users are not happy having their telephones barred from ordinary calls while they are using the system

It is probably better to resign yourself to having to wait until a faster cable networking system can be used This is likely, however, to be several years away

Old chestnuts roasted

WHERE'S THE expansion port on the Commodore 64?
UNLIKE the Vic 20 the Commodore 64 has 64k of RAM that cannot be increased. There is therefore no expansion port
ARE THERE two different sorts of Commodore 64 on the market (there are two distinct colours and various nameplates)?
YES, THERE are two sorts of Commodore 64, NTSC and PAL The NTSC is the American version and the PAL the English version. The PAL version is the only one available in this country
WHERE DO you connect the printer when the disk drive is being used?
THE PRINTER is connected directly into the serial port in the back of the disk drive unit.
WHEN TYPING in a program, why is it not possible to get reverse characters (i e Print "(CNTRL/9)ABCDE ")?
THE LETTERS "ABCDE" will only appear in reverse when the program is run
THE POKE location in the centre of the screen when addressed should show a white ball (see user guide) why doesn't it?
THE COLOUR memory needs to be POKEd with a colour different to that of the background colour before the ball becomes visible.
CAN YOU use a prerecorded software for the 8000 series on the Commodore 64?
YOU CAN, but only if the programs don't refer to the screen and there are no machine code routines
CAN YOU run Vic 20 software on the Commodore 64?
VIC 20 software is not compatible with the Commodore 64 (In some circumstances if the program is in ordinary Basic and does not use POKE statements it will run.)
THE TANK v UFO program in the rear of the Vic 20 user manual has a line 135 with 89 characters why?
THE MAXIMUM allowed on one line is 4×22=88 characters, therefore you must abbreviate this line This is made possible by either omitting all spaces or by using the shortened forms of the Basic key words, eg P(shifted R) for the PRINT statement

Much more on memory

I HAVE yet to discover the full advantages of the 16K Ram pack for the Vic 20

Other than the knowledge that its introduction relocates the Basic screen and colour, I have yet to find a successful routine program to enable 3 5K programs to be run using the 16K addition

This is particularly frustrating as I am not able to expand conventional programs above the memory available I am new to home computers but ' experts have advised me that all the problems referred to can be overcome Could you please advise me

T Waldron
Quarry Bank
West Midlands

I AM sure you do not need us to tell you that the main advantage of the 16K memory expansion is that you can run far longer and hopefully, better programs You will not, for example find many adventure programs which will fit inside 3 5K

Programs written in Basic alone do not need to be adapted to run on the expanded system Although the Basic program needs to be relocated the system will handle it automatically

As you rightly imply, problems only arise when you have 3 5k programs which POKE to the screen or colour areas To make these programs run try typing in the following POKEs before loading the program I have not tried this routine but it comes from a good source — an article by Mike Todd on page 30 of the Spring '83 Vicsoft catalogue

POKE 641 0 <return>
POKE 642 18 <return>
POKE 643 0 <return>
POKE 644 96 <return>
POKE 648 16 <return>
SYS 64824 <return>

More than the Basics

I HOPE to buy a computer, probably a Commodore 64 One thing I would like to know is what is machine code?

Paul Fretman
Pinner
Middx

MACHINE code is essentially just a long list of numbers which are converted into binary by the computer

If you need help with a technical query or problem write to Answer Back Commodore Horizons 12 13 Little Newport Street London WC2R 3LD

IT WAS a poor night at the Hell Nook Micro Club. Only Algernon, Bertie, Cyril, Drusilla and Ermintrude had turned up. They made the usual mess setting up their equipment.

The club room, Commodore Hall, was in fact, a dilapidated Ses Scout hut, with trestle tables arranged down one wall, a row of sockets on the wall at the end and various chairs, boats, ropes and so on scattered all around.

The only really bright spots in the room were the row of plugs connecting the various micros to the power supply. Each was a different colour, matching the colour of the lead running to each micro. Five different screens were each glowing with the graphics of their respective owners' favourite game (all different of course). Except, that is, the 20 inch colour TV, which seemed to have become detached, as did the joystick in the debris on the floor.

When the five connected their systems up each machine was complete, each with its single peripheral (the joystick and a light pen, a voice box, some disk drives, and a printer). Can you find where the disconnected kit belongs?

Here's some information that may help. The red lead runs to the Pet, the green plug powers the light-pen, Frogger is running on the machine connected to the yellow cable and the Spectrum is on the table next to the micro on the blue lead.

There's a 26 inch screen connected to the Vic 20, King Kong is the game running next to the tiny flat screen receiver and Froger next to the monochrome 14 inch television.

The cassette drive is connected to the Commodore 64, and the voice box is on the middle machine.

The invaders game is not showing up too well on the monitor, but the Hobbit, which is running on the Oric, looks clear enough. The adventure game is huge, though, and needs disk drives all the time.

The left most machine is the Spectrum and the micro powered by the green plug sits to the right of that on the white one.

All the machines, peripherals, leads, plugs and TVs are in the same order. They might be in a mess, but not that much of a mess.

As a tie-breaker, complete the following sentence in less than 15 words: I want to add Commodore disk drives to my system because

Send your answers to Competition Corner, Commodore Horizons, 12-14 Little Newport Street, London WC2R 3LD — to arrive no later than the last working day in the month on the cover of this issue. The name of the winner and the solution to the puzzle, will be published in the issue after ours. Entries will not be acknowledged and we cannot enter into correspondence on the result.

COMPETITION CORNER

Win a CBM disk drive

Commodore provides the prize. Tony Roberts the puzzle

MARKET VIEW

Shake, rattle, and rall . . .

WHATEVER happened to the money-spinning computer industry that was never going to look back? In recent weeks, the industry's relationship with investors has come under increasing strain, but Commodore thinks it can stay ahead.

On the home computer front, Iotech is no more, while Newbrain maker Grundy Business Systems, burdened by debts of nearly £3 million, searches for a saviour. The news at the heavyweight end of the market is no better. Atari, Texas Instruments, Mattel, Victor Technology and Fortune Systems have all turned in massive losses this year.

In the UK, ACT introduced the Apricot at the PCW show to a fanfare of favourable reviews and advance orders. ACT shares promptly fell 30p in two days.

Acorn barely attracted enough support to float 10% of the company's shares on the Stock Exchange's Unlisted Securities Market at the minimum asking price. One stockbroker analyst could even say of this company which has a seemingly impeccable pedigree: "Fundamentally, Acorn are a disaster. There's a very real chance they will be bust in two years."

What lessons can be learnt from this shake out in the industry? First, after a spell when small seemed beautiful — Acorn sales last year were £42 million against 1979's £31,000 — it looks at the moment as if big is better. Mighty IBM, after losing market share to rivals, is slaying mainframe competitors like Honeywell and Amdahl, carrying all before it with the cheaper PC and sending tremors through Apple's share price just with the threat of the Peanut.

If size is to be a guarantee of survival — although remember that Atari and Mattel turned huge profits into losses of hundreds of millions of dollars — then Commodore looks set to stay the course. Commodore itself believes: "Eventually the number of computer producers will be reduced to a handful of companies" — and backs its survival with assets of £330 million devoted to computer interests.

Confidence and assets like that enable Commodore to press ahead with plans to raise production at its Corby plant to three million units a year.

The second moral from these troubled times is that grabbing a bigger slice of the market means accepting ever shrinking profit margins and/or pruning costs ruthlessly. Many companies over produced and couldn't cut prices to keep up with newer, more cheaply produced rivals — they ended up with piles of stock back at their warehouses, spelling hefty losses or bankruptcy.

Here again, Commodore looks well placed. In spite of the current difficulties facing the small computer market, it seems clear that consumer demand is still rising. Steve Greenberg, New York marketing consultant to Commodore, reckons that two million home computers were sold in 1982. The 1983 figure will be nearer five million and Commodore expects to take 40%. Greenberg puts the world market at 50 million units by 1987.

Commodore chairman Jack Tramiel hopes to keep Commodore in front by following two principles: "We believe in high volume products and we pass our cost savings on — the sooner the better." That philosophy has made deep inroads into Commodore prices at all levels of the computer market. At the lower end, the Vic 20 now costs £140 against last year's £194 while the price of the Commodore 64 has dropped from £300 to £229.

Dealers big and small — operating on 30% average discounts — are willing to sell the 64 below £200 and US buyers pay a mere £133. In theory, more is still to come.

But cutting margins to bare minimums may spell trouble for the firmly established Commodore — even Tramiel must accept that in an industry where companies are cutting their own as much as each other's throats, there are no winners.

Christmas in the UK will be crucial — Commodore hopes to sell 400,000 computers by Christmas backed by a hefty £10 million advertising budget. If rivals follow suit, it looks like being a happy Christmas for consumers, but how many computer firms will enjoy a prosperous New Year?

The Lightening Oric Assembler £9.90*

There are other assemblers for the ORIC but none combine the same features and ease of use that we have [illegible] this comprehensive utility [illegible] for the ORIC 48K. The manual which accompanies the assembler gives a brief insight into machine code and the use of assemblers to enable anyone to write in assembly language after just a little study. [illegible] fitted into the small space available [illegible]

Crazy Golf £6.90
48K Spectrum

Crazy golf is a new program for the 48K Spectrum you are required to [illegible] the course [illegible] and circumventing the [illegible] obstacles, finally putting your ball in the hole. The par [illegible] is displayed and a move direction indicator combined with a force indicator enables you to send the golf ball in the direction you feel is the best [illegible] the course. Crazy golf really is [illegible] fun and can be [illegible] by all members of the family. [illegible]

Bengo £6.90
Vic 20

An exciting program for the unexpanded Vic 20 which combines fast moving strategy and reflexes. You must control Bengo, the huge Eskimo against the dreadful snow [illegible]. Half [illegible] the Yeti can smell a good Eskimo lunch. The only protection Bengo has is to push huge blocks [illegible] the frozen waste at the Yeti.

Don't get distracted or you'll be personally responsible for the demise of an Eskimo. [illegible]

Dracula £6.90
48K ORIC

[illegible]

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[illegible]

Digger £8.90
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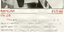
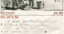
[illegible]

Mysterious Island £9.90
Vic 20 16K

[illegible]



RAMGAM £15.90
Vic 20

[illegible]

Punchy £6.90
Spectrum 48K

Punch has taken [illegible] Judy. By [illegible]

[illegible] £9.90
Dragon 32

[illegible]

Goldrush £6.90
Vic 20 3.5K

[illegible]

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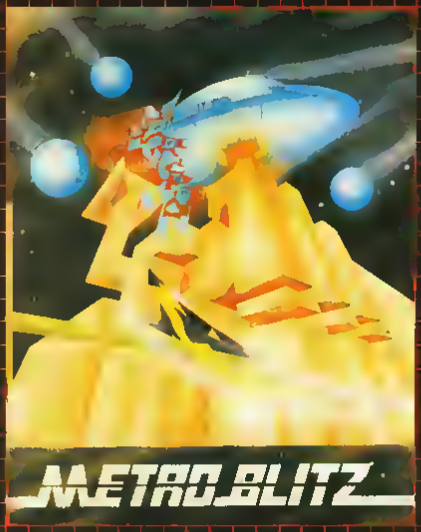

METROBLITZ

The object of this game is to defend your city against an onslaught of suicidal aliens. Six different types of aliens bombard the player's city without mercy, having no respect for their own lives.

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You are the GOOD GUY, Freedom Fighter and renowned star pilot. The BAD GUYS, an alien race from distant solar system have invaded NEOCLYPS, one of your colonial planets.
Being the good guy that you are, you set off to liberate the Common Folk of Neoclyps from the oppression of the Bad Guys. The Bad Guys have populated Neoclyps with several radar towers which reveal your position to them.

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You are caught in a vicious jungle of giant insects. Centipedes are attacking you from all sides. Killer flies are dropping from the sky, and to top things off there's a venomous spider lurking in the background.

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Your object is to overcome various obstacles and overpower creatures intent on stopping you as you progress on your quest for the Krystals of Zong. Quick reactions will be necessary if you are to succeed thus will guide you.

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